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DRINKING WATER SURVEILLANCE PROGRAM

# CHATHAM WATER TREATMENT PLANT

REPORT FOR 1991 AND 1992

Ontario

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# DRINKING WATER SURVEILLANCE PROGRAM

# REPORT FOR 1991 AND 1992

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PIBS 2961

## EXECUTIVE SUMMARY

## DRINKING WATER SURVEILLANCE PROGRAM

## CHATHAM WATER TREATMENT PLANT
## 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Chatham water treatment plant is a conventional treatment plant which treats water from Lake Erie. Raw water is chlorinated at the lowlift pumping station and is then pumped 9 kilometres to the water treatment plant in Chatham. The process consists of coagulation, flocculation, sedimentation, filtration, fluoridation and disinfection. This plant has a design capacity of 91.0 x 1000 $m^3$/day. The Chatham water treatment plant serves a population of approximately 42,000.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Chatham water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

| SCAN | SITE RAW TESTS | RAW POSITIVE | RAW %POSITIVE | TREATED TESTS | TREATED POSITIVE | TREATED %POSITIVE | MCFADDEN AVE TESTS | MCFADDEN AVE POSITIVE | MCFADDEN AVE %POSITIVE | KERR ST TESTS | KERR ST POSITIVE | KERR ST %POSITIVE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BACTERIOLOGICAL | 30 | 12 | 40 | 10 | 1 | 10 | 8 | 6 | 75 | 6 | 4 | 66 |
| CHEMISTRY (FIELD) | 55 | 55 | 100 | 60 | 60 | 100 | 78 | 75 | 96 | 48 | 47 | 97 |
| CHEMISTRY (LABORATORY) | 236 | 206 | 87 | 237 | 185 | 78 | 269 | 237 | 88 | 168 | 149 | 88 |
| METALS | 240 | 101 | 42 | 240 | 98 | 40 | 299 | 140 | 46 | 184 | 81 | 44 |
| CHLOROAROMATICS | 98 | 0 | 0 | 98 | 0 | 0 | 70 | 0 | 0 | 56 | 0 | 0 |
| CHLOROPHENOLS | 6 | 0 | 0 | 6 | 0 | 0 | . | . | . | . | . | . |
| PESTICIDES AND PCB | 233 | 1 | 0 | 234 | 0 | 0 | 111 | 1 | 0 | 89 | 0 | 0 |
| PHENOLICS | 10 | 1 | 10 | 9 | 0 | 0 | . | . | . | . | . | . |
| POLYAROMATIC HYDROCARBONS | 67 | 0 | 0 | 68 | 0 | 0 | 51 | 0 | 0 | 34 | 0 | 0 |
| SPECIFIC PESTICIDES | 26 | 0 | 0 | 26 | 0 | 0 | . | . | . | 1 | 0 | 0 |
| VOLATILES | 296 | 31 | 10 | 296 | 40 | 13 | 236 | 32 | 13 | 176 | 24 | 13 |
| RADIONUCLIDES | 14 | 2 | 14 | 14 | 3 | 21 | . | . | . | . | . | . |
| TOTAL | 1,311 | 409 | | 1,298 | 387 | | 1,122 | 491 | | 762 | 305 | |

# DRINKING WATER SURVEILLANCE PROGRAM

## CHATHAM WATER TREATMENT PLANT
## 1991 AND 1992 REPORT

### INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Chatham water treatment plant in December 1988. Previous annual reports were published for 1989 and 1990.

### PLANT DESCRIPTION

The Chatham water treatment plant is a conventional treatment plant which treats water from Lake Erie. Raw water is chlorinated at the lowlift pumping station and is then pumped 9 kilometres to the water treatment plant in Chatham. The process consists of coagulation, flocculation, sedimentation, filtration, fluoridation and disinfection. This plant has a design capacity of 91.0 x 1000 $m^3$/day. The Chatham water treatment plant serves a population of approximately 42,000.

The sample day flows ranged from 23.7 x 1000 $m^3$/day to 33.2 x 1000 $m^3$/day.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

### SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

At the Chatham water treatment plant it was not possible to obtain an unchlorinated raw water sample.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

## RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

## DISCUSSION

### GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). These objectives are applied to free flowing water. When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

**IN THIS REPORT, DISCUSSION IS LIMITED TO:**

- **THE TREATED AND DISTRIBUTED WATER;**
- **ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND**
- **POSITIVE ORGANIC PARAMETERS DETECTED.**

### BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single

samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water.

Standard plate count is a test used to supplement routine analysis for coliform bacteria. The limit for standard plate count (at 35°C after 48 hours) in the ODWOs is 500 counts/mL (based on a geometric mean of 5 or more samples). DWSP bacteriological analysis of treated and distributed water was limited to standard plate count.

Standard plate count (membrane filtration) exceeded the ODWO Aesthetic Objective of 500 counts/mL in 4 of 20 treated and distributed water samples with a maximum reported value of 1,800 counts/mL.

## INORGANIC & PHYSICAL

### CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 12 of 24 treated and distributed water samples with a maximum reported value of 21.0°C.

### CHEMISTRY (LABORATORY)

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions. Colour is measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 1 of 24 treated and distributed water samples with a maximum reported value of 5.5 HZU.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L in all 24 treated and distributed water samples with a maximum reported value of 131.0 mg/L.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Unit (FTU) and applies to water leaving the treatment facility.

Turbidity exceeded the ODWO Maximum Acceptable Concentration of 1.0 FTU in 5 of 10 treated water samples with a maximum reported value of 2.9 FTU. The results were not confirmed by the corresponding and more reliable field turbidity results.

The common occurrence of elevated turbidity readings in the laboratory turbidity test is unusual. It is suspected that the plant treated water sample line may have been installed in a poor location. This is being investigated in early 1993.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 7 of 24 treated and distributed water samples with a maximum reported value of 240.0 ug/L.

Iron exceeded the ODWO Aesthetic Objective of 300 ug/L in 1 of 24 treated and distributed water samples with a maximum reported value of 400 ug/L.

The presence of elevated lead in standing samples from the distribution system indicates that household taps should be flushed, until the coolest water temperature is obtained, before water is used for consumption. The concentration of lead and other metals can increase while the water is standing in the service line and home plumbing. The health related ODWO for lead is applied to the free flowing sample.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

PESTICIDES AND PCB

Hexachlorocyclopentadiene was found at a positive level in 1 of the 11 treated and distributed water samples analyzed. The maximum observed level was 56.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

PHENOLICS

The results of the phenolics test showed that none were detected above trace levels.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 24 treated and distributed water samples analyzed with a maximum level of 61.2 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

Trihalomethanes were detected in 8 raw water samples. The raw water is chlorinated at the lowlift pumping station and is transported 9 kilometres to the treatment facility. It is not possible to obtain an unchlorinated raw water sample.

## RADIOLOGICAL

### RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

## CONCLUSIONS

The presence of elevated lead in standing samples from the distribution system indicates that household taps should be flushed, until the coolest water temperature is obtained, before water is used for consumption. The concentration of lead and other metals can increase while the water is standing in the service line and home plumbing. The health related ODWO for lead is applied to the free flowing sample.

The common occurrence of elevated turbidity readings in the laboratory turbidity test is unusual. It is suspected that the plant treated water sample line may have been installed in a poor location. This is being investigated in early 1993.

No known health related guidelines were exceeded.

The Chatham water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

FIGURE 1

# CHATHAM WATER TREATMENT PLANT

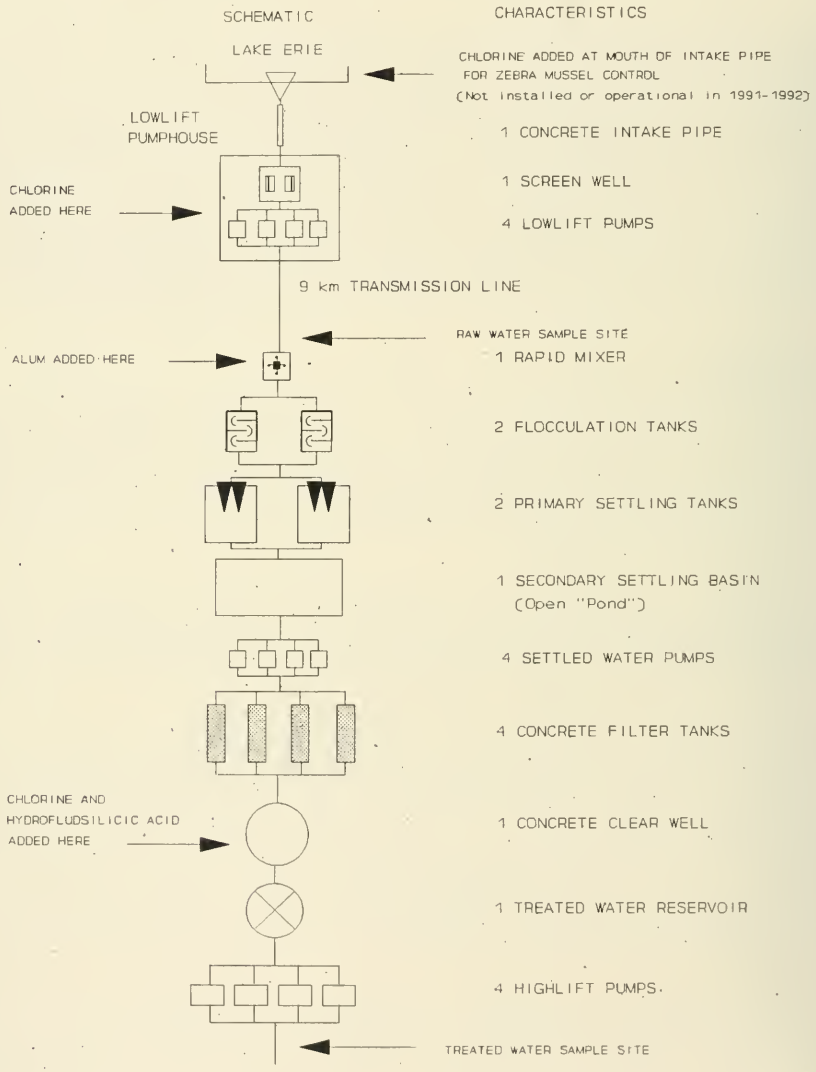
SCHEMATIC
CHARACTERISTICS
LAKE ERIE
CHLORINE ADDED AT MOUTH OF INTAKE PIPE FOR ZEBRA MUSSEL CONTROL (Not installed or operational in 1991-1992)
LOWLIFT PUMPHOUSE
1 CONCRETE INTAKE PIPE
CHLORINE ADDED HERE
1 SCREEN WELL
4 LOWLIFT PUMPS
9 km TRANSMISSION LINE
RAW WATER SAMPLE SITE
ALUM ADDED HERE
1 RAPID MIXER
2 FLOCCULATION TANKS
2 PRIMARY SETTLING TANKS
1 SECONDARY SETTLING BASIN (Open "Pond")
4 SETTLED WATER PUMPS
4 CONCRETE FILTER TANKS
CHLORINE AND HYDROFLUDSILICIC ACID ADDED HERE
1 CONCRETE CLEAR WELL
1 TREATED WATER RESERVOIR
4 HIGHLIFT PUMPS
TREATED WATER SAMPLE SITE

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

| | |
|---|---|
| PLANT NAME: | CHATHAM WTP |
| WORKS #: | 220003378 |
| UTM #: | 174165654678830 |
| DISTRICT: | CHATHAM |
| REGION: | SOUTHWEST |
| DISTRICT OFFICER: | J. DRUMMOND |
| SUPERINTENDENT: | KEN BANKS |
| ADDRESS: | 325 GRAND AVE. E.<br>CHATHAM, ONTARIO<br>N7L 1W9<br>519-352-5840 |
| MUNICIPALITY: | CHATHAM |
| AUTHORITY: | MUNICIPAL |

PLANT INFORMATION

| | | |
|---|---|---|
| PLANT VOLUME: | - | (X 1000 M3) |
| DESIGN CAPACITY: | 91.000 | (X 1000 M3/DAY) |
| RATED CAPACITY: | - | (X 1000 M3/DAY) |

| MUNICIPALITY | POPULATION |
|---|---|
| CHATHAM | 42,000 |

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

| PARAMETER | LOCATION | FREQUENCY |
|---|---|---|
| ALUMINUM | LAB TREATED | WEEKLY |
| COMBINED CHLORINE RESIDUAL | LAB TREATED | WEEKLY |
| FREE CHLORINE RESIDUAL | LAB TREATED | WEEKLY |
| TOTAL CHLORINE RESIDUAL | LAB TREATED | DAILY |
| PH | LAB TREATED | WEEKLY |
| TEMPERATURE | LAB TREATED | DAILY |
| TURBIDITY | LAB TREATED<br>TREATED | DAILY<br>CONTINUOUS |

TABLE 3
ORINKING WATER SURVEILLANCE PROGRAM CHATHAM WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

| DATE | DELAY * TIME(HRS) | FLOW (1000M3) | PRE CHLORINATION CHLORINE | COAGULATION ALUM LIQUID | FLUORIDATION HYDROFLUOSILICIC ACID | POST CHLORINATION CHLORINE |
|---|---|---|---|---|---|---|
| 91 FEB 05 | 23.00 | 25.100 | .98 | 8.50 | . | .75 |
| 91 APR 03 | 26.00 | 24.239 | 1.37 | 15.13 | .90 | .86 |
| 91 JUN 04 | 21.00 | 27.662 | 1.33 | 10.12 | .93 | 1.05 |
| 91 AUG 07 | 19.00 | 33.272 | 1.32 | 8.83 | .92 | 1.28 |
| 91 OCT 08 | 22.00 | 23.903 | 1.54 | 18.20 | . | 1.10 |
| 91 DEC 03 | 22.00 | 23.753 | 1.10 | 14.30 | .80 | .80 |
| 92 FEB 04 | 18.00 | 25.067 | .88 | 7.26 | .90 | .80 |
| 92 MAY 06 | 24.00 | 24.758 | .97 | 8.74 | .91 | .81 |
| 92 JUL 07 | 24.00 | 28.903 | 1.01 | 9.25 | .91 | 1.04 |
| 92 OCT 06 | 22.00 | 27.185 | 1.49 | 9.54 | .93 | 1.10 |

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

## KEY TO TABLE 4 and 5

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
- 1. Maximum Acceptable Concentration (MAC)
- 1+. MAC for Total Trihalomethanes
- 2. Interim Maximum Acceptable Concentration (IMAC)
- 3. Aesthetic Objective (AO)
- 3*. AO for Total Xylenes
- 4. Recommended Operational Guideline
- 5. Health Related Guidance Value

B HEALTH & WELFARE CANADA (H&W)
- 1. Maximum Acceptable Concentration (MAC)
- 2. Proposed MAC
- 3. Interim MAC
- 4. Aesthetic Objective (AO)

C WORLD HEALTH ORGANIZATION (WHO)
- 1. Guideline Value (GV)
- 2. Tentative GV
- 3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
- 1. Maximum Contaminant Level (MCL)
- 2. Suggested No-Adverse Effect Level (SNAEL)
- 3. Lifetime Health Advisory
- 4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)
- 1. Health Related Guideline Level
- 2. Aesthetic Guideline Level
- 3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

## LABORATORY RESULTS, REMARK DESCRIPTIONS

| | |
|---|---|
| . | No Sample Taken |
| BDL | Below Minimum Measurement Amount |
| <T | Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE) |
| > | Results Are Greater Than The Upper Limit |
| <=> | Approximate Result |
| !48 | No Data: Sample Age Exceeded 48 Hours |
| !AR | No Data: No Numeric Results |
| !AW | No Data: Analysis Withdrawn |
| !BT | No Data: Sample Broken In Transit |
| !CS | No Data: Contamination Suspected |
| !EF | No Data: Laboratory Equipment Failure |
| !IR | No Data: Insufficient Sample |
| !IS | No Data: Insufficient Sample |
| !LA | No Data: Laboratory Accident |
| !NP | No Data: No Procedure |
| !NR | No Data: Sample Not Received |
| !OP | No Data: Obscured Plate |
| !PE | No Data: Procedure Error: Sample Discarded |
| !PR | No Data: Preservative Required |
| !QU | No Data: Quality Control Unacceptable |
| !RE | No Data: Received Empty |
| !RO | No Data: No Numeric Results |
| !SM | No Data: Sample Missing |
| !SS | No Data: Sample Improperly Preserved |
| !U | No Data: Sample Unsuitable For Analysis |
| !UB | No Data: Bottle Broken |
| !UN | No Data: Result Unreliable |

| | |
|---|---|
| !UR | No Data: Unpreserved Sample Required |
| A | Approximate Value |
| A3C | Approximate, Total Count Exceeded 300 Colonies |
| A> | Approximate Value, Exceeded Normal Range |
| APS | Additional Peak, Less Than, Not Priority Pollutant |
| ARO | Additional Information In Laboratory Report |
| CRO | Calculated Result Only |
| NAF | Not All Required Tests Found |
| RID | Ioncal Calculated on Incomplete Data Set |
| RMP | P and M-Xylene Not Separated |
| RRR | Result Obtained by Repeat Analysis |
| RRV | Rerun Verification |
| SFA | Sample Filtered: Filtrate Analyzed |
| SIL | Sample Incorrectly Labelled |
| SPS | Several Peaks, Small, Not Priority Pollutant |
| U48 | Unreliable: Sample Age Exceeded 48 Hours |
| UAL | Unreliable: Sample Age Exceeded Limit |
| UAU | Unreliable: Sample Age Unknown |
| UCS | Unreliable: Contamination Suspected |
| WSD | Wrong Sample Description On Bottle |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| BACTERIOLOGICAL | | | | | | |
| FECAL COLIFORM MF (CT/100ML ) | | DET'N LIMIT = 0 | | | GUIDELINE = 0 (A1) | |
| 1991 FEB | BDL | . | . | . | . | . |
| 1991 APR | BDL | . | . | . | . | . |
| 1991 JUN | 0 | . | . | . | . | . |
| 1991 AUG | 1 A3C | . | . | . | . | . |
| 1991 OCT | BDL | . | . | . | . | . |
| 1991 DEC | BDL | . | . | . | . | . |
| 1992 FEB | BDL | . | . | . | . | . |
| 1992 MAY | 0 | . | . | . | . | . |
| 1992 JUL | 0 | . | . | . | . | . |
| 1992 OCT | 3 | . | . | . | . | . |
| STANDRD PLATE CNT MF (CT/ML ) | | DET'N LIMIT = 0 | | | GUIDELINE = 500 (A3) | |
| 1991 FEB | . | 1 <=> | . | . | 0 <=> | . |
| 1991 APR | . | 0 <=> | 1 <=> | . | . | . |
| 1991 JUN | . | 2 <=> | 63 | . | 740 | . |
| 1991 AUG | . | 5 <=> | 113 | . | 610 | . |
| 1991 OCT | . | 210 | 36 | . | 11 | . |
| 1991 DEC | . | 0 <=> | 3 <=> | . | 5 <=> | . |
| 1992 FEB | . | 6 <=> | 23 | . | . | . |
| 1992 MAY | . | 1 <=> | . | . | 550 | . |
| 1992 JUL | . | 0 <=> | 1800 | . | . | . |
| 1992 OCT | . | 3 <=> | 23 | . | . | . |
| TOTAL COLIFORM MF (CT/100ML ) | | DET'N LIMIT = 0 | | | GUIDELINE = 5/100ML (A1) | |
| 1991 FEB | BDL | . | . | . | . | . |
| 1991 APR | BDL | . | . | . | . | . |
| 1991 JUN | 0 | . | . | . | . | . |
| 1991 AUG | 3 A3C | . | . | . | . | . |
| 1991 OCT | BDL | . | . | . | . | . |
| 1991 DEC | BDL | . | . | . | . | . |
| 1992 FEB | BDL | . | . | . | . | . |
| 1992 MAY | BDL | . | . | . | . | . |
| 1992 JUL | BDL | . | . | . | . | . |
| 1992 OCT | 30 <=> | . | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| | BACTERIOLOGICAL | | | | | |
| T COLIFORM BCKGRD MF (CT/100ML ) | | | DET'N LIMIT = 0 | | GUIDELINE = N/A | |
| 1991 FEB | BDL | . | . | . | . | . |
| 1991 APR | 88 | . | . | . | . | . |
| 1991 JUN | 25 | . | . | . | . | . |
| 1991 AUG | 2400 > | . | . | . | . | . |
| 1991 OCT | 24000 > | . | . | . | . | . |
| 1991 DEC | 140 | . | . | . | . | . |
| 1992 FEB | 460 | . | . | . | . | . |
| 1992 MAY | 9600 > | . | . | . | . | . |
| 1992 JUL | 48000 > | . | . | . | . | . |
| 1992 OCT | 24000 > | . | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (FIELD) | | | | | | |
| FLO CHLORINE (COMB) (MG/L ) | | | DET'N LIMIT = 0 | | GUIDELINE = N/A | |
| 1991 FEB | .050 | .100 | . | . | .100 | . |
| 1991 APR | .060 | .200 | .200 | .050 | . | . |
| 1991 JUN | .050 | .230 | .100 | .050 | .200 | . |
| 1991 AUG | .050 | .150 | .100 | . | .100 | . |
| 1991 OCT | .250 | .150 | .150 | . | .100 | . |
| 1991 DEC | .200 | .100 | .100 | . | .200 | .000 |
| 1992 FEB | .150 | .200 | .150 | .030 | . | . |
| 1992 MAY | .150 | .100 | . | . | .100 | .100 |
| 1992 JUL | . | .200 | .150 | .000 | . | . |
| 1992 OCT | . | .200 | .000 | .000 | . | . |
| FLO CHLORINE FREE (MG/L ) | | | DET'N LIMIT = 0 | | GUIDELINE = N/A | |
| 1991 FEB | .200 | .800 | . | . | .250 | . |
| 1991 APR | .020 | .800 | .200 | .050 | . | . |
| 1991 JUN | .050 | .720 | .300 | .050 | .100 | . |
| 1991 AUG | .050 | .850 | .100 | . | .100 | . |
| 1991 OCT | .800 | .850 | .150 | . | .300 | . |
| 1991 DEC | .500 | .900 | .150 | . | .100 | .100 |
| 1992 FEB | .600 | .800 | .300 | .020 | . | . |
| 1992 MAY | .250 | .750 | . | . | .200 | .100 |
| 1992 JUL | . | .750 | .100 | .050 | . | . |
| 1992 OCT | . | .800 | .150 | .050 | . | . |
| FLO CHLORINE (TOTAL) (MG/L ) | | | DET'N LIMIT = 0 | | GUIDELINE = N/A | |
| 1991 FEB | .250 | .900 | . | . | .350 | . |
| 1991 APR | .080 | 1.000 | .400 | .100 | . | . |
| 1991 JUN | .100 | .950 | .400 | .100 | .300 | . |
| 1991 AUG | .100 | 1.000 | .200 | . | .200 | . |
| 1991 OCT | 1.050 | 1.000 | .300 | . | .400 | . |
| 1991 DEC | .700 | 1.000 | .250 | . | .300 | .100 |
| 1992 FEB | .750 | 1.000 | .450 | .050 | . | . |
| 1992 MAY | .400 | .850 | . | . | .300 | .200 |
| 1992 JUL | .050 | .950 | .250 | .050 | . | . |
| 1992 OCT | . | 1.000 | .150 | .050 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (FIELD) | | | | | | |
| FLD PH (DMNSLESS ) | | | DET'N LIMIT = N/A | | GUIDELINE = 6.5-8.5 (A4) | |
| 1991 FEB | 7.200 | 7.200 | . | . | 7.400 | . |
| 1991 APR | 7.900 | 7.250 | 7.400 | 7.400 | . | . |
| 1991 JUN | 7.600 | 7.400 | 7.300 | 7.400 | 7.600 | . |
| 1991 AUG | 7.600 | 7.450 | 7.400 | . | 7.600 | . |
| 1991 OCT | 7.600 | 7.400 | 7.600 | . | 7.400 | . |
| 1991 DEC | 7.600 | 7.400 | 7.600 | . | 7.600 | 7.400 |
| 1992 FEB | 7.700 | 7.400 | 7.300 | 7.300 | . | . |
| 1992 MAY | 7.800 | 7.500 | . | . | 7.600 | 7.400 |
| 1992 JUL | 7.800 | 7.500 | 7.300 | 7.300 | . | . |
| 1992 OCT | 7.800 | 7.400 | 7.450 | 7.450 | . | . |
| FLD TEMPERATURE (DEG.C ) | | | DET'N LIMIT = N/A | | GUIDELINE = 15 (A3) | |
| 1991 FEB | 5.000 | 2.000 | . | . | 3.000 | . |
| 1991 APR | 5.000 | 5.000 | 6.500 | 12.000 | . | . |
| 1991 JUN | 11.000 | 11.000 | 16.000 | 18.000 | 16.000 | . |
| 1991 AUG | 20.000 | 21.000 | 21.000 | . | 20.000 | . |
| 1991 OCT | 16.500 | 16.000 | 18.000 | . | 19.000 | . |
| 1991 DEC | 7.000 | 8.000 | 11.000 | . | 15.000 | 20.000 |
| 1992 FEB | 2.500 | 3.000 | 6.500 | 12.000 | . | . |
| 1992 MAY | 8.500 | 8.500 | . | . | 12.000 | 21.000 |
| 1992 JUL | 17.500 | 19.000 | 18.000 | 20.500 | . | . |
| 1992 OCT | 17.000 | 17.000 | 18.000 | 18.000 | . | . |
| FLD TURBIDITY (FTU ) | | | DET'N LIMIT = N/A | | GUIDELINE = 1.0 (A1) | |
| 1991 FEB | 3.680 | .030 | . | . | .040 | . |
| 1991 APR | 25.000 | .040 | .200 | .800 | . | . |
| 1991 JUN | 2.000 | .030 | .080 | .800 | .400 | . |
| 1991 AUG | 2.000 | .750 | .160 | . | .250 | . |
| 1991 OCT | 68.000 | .730 | .200 | . | .200 | . |
| 1991 DEC | 35.000 | .030 | .160 | . | .260 | .190 |
| 1992 FEB | 1.100 | .020 | .250 | .730 | . | . |
| 1992 MAY | 1.600 | .040 | . | . | .700 | .380 |
| 1992 JUL | 3.900 | .080 | .750 | .850 | . | . |
| 1992 OCT | 6.800 | .090 | .200 | .550 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| | CHEMISTRY (LABORATORY) | | | | | |
| ALKALINITY (MG/L ) | | | DET'N LIMIT = 0.2 | | GUIDELINE = 30-500 (A4) | |
| 1991 FEB | 93.800 | 84.300 | . | . | 85.800 | . |
| 1991 APR | 96.200 | 82.400 | 83.800 | 85.200 | . | . |
| 1991 JUN | 98.400 | 86.200 | 86.800 | 90.000 | 89.600 | . |
| 1991 AUG | 101.700 | 92.100 | 92.200 | . | 93.100 | . |
| 1991 OCT | 94.400 | 86.200 | 88.000 | . | 87.700 | . |
| 1991 DEC | 89.100 | 74.300 | 74.800 | . | 76.700 | 77.100 |
| 1992 FEB | 80.500 | 84.000 | 83.900 | 86.900 | . | . |
| 1992 MAY | 93.300 | 85.700 | . | . | 84.300 | 84.900 |
| 1992 JUL | 93.600 | 84.000 | 84.400 | 84.800 | . | . |
| 1992 OCT | 85.700 | 75.900 | 76.600 | 77.000 | . | . |
| CALCIUM (MG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 100 (F2) | |
| 1991 FEB | 35.000 | 34.000 | . | . | 36.000 | . |
| 1991 APR | 33.600 | 35.600 | 34.700 | 34.800 | . | . |
| 1991 JUN | 36.200 | 36.600 | 36.800 | 37.000 | 37.800 | . |
| 1991 AUG | 38.200 | 38.200 | 38.400 | . | 37.200 | . |
| 1991 OCT | 34.900 | 34.500 | 34.700 | . | 34.100 | . |
| 1991 DEC | 31.200 | 31.700 | 29.700 | . | 30.600 | 30.800 |
| 1992 FEB | 34.300 | 35.300 | 33.200 | 34.700 | . | . |
| 1992 MAY | 34.100 | 33.750 | . | . | 34.800 | 34.850 |
| 1992 JUL | 33.600 | 34.100 | 34.100 | 34.400 | . | . |
| 1992 OCT | 29.600 | 30.200 | 30.650 | 30.000 | . | . |
| CYANIDE (MG/L ) | | | DET'N LIMIT = 0.001 | | GUIDELINE = 0.2 (A1) | |
| 15 SAMPLES | BDL | BDL | . | . | . | . |
| CHLORIDE (MG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 250 (A3) | |
| 1991 FEB | 13.800 | 15.500 | . | . | 15.600 | . |
| 1991 APR | 13.600 | 16.300 | 16.400 | 17.100 | . | . |
| 1991 JUN | 14.800 | 16.900 | 17.000 | 18.100 | 16.800 | . |
| 1991 AUG | 15.600 | 18.100 | 18.100 | . | 17.200 | . |
| 1991 OCT | 17.100 | 18.100 | 18.000 | . | 17.800 | . |
| 1991 DEC | 12.800 | 13.900 | 14.200 | . | 14.100 | 13.800 |
| 1992 FEB | 29.100 | 15.300 | 16.500 | 15.600 | . | . |
| 1992 MAY | 15.800 | 17.100 | . | . | 17.700 | 17.500 |
| 1992 JUL | 15.500 | 17.800 | 17.900 | 18.200 | . | . |
| 1992 OCT | 11.700 | 15.000 | 16.100 | 12.200 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

CHEMISTRY (LABORATORY)

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| COLOUR (HZU ) | | | DET'N LIMIT = 0.50 | | GUIDELINE = 5 (A3) | |
| 1991 FEB | 1.000 <T | .500 <T | . | . | 2.000 <T | . |
| 1991 APR | BDL | .500 <T | 1.500 <T | 2.500 | . | . |
| 1991 JUN | BDL | .500 <T | 1.500 <T | 2.500 | 2.500 | . |
| 1991 AUG | 2.000 | 2.000 | 1.000 <T | . | 2.000 | . |
| 1991 OCT | .500 <T | 1.500 | .500 <T | . | 1.000 | . |
| 1991 DEC | 3.500 | .500 <T | 2.500 | . | 1.500 | 1.500 |
| 1992 FEB | BDL | 2.000 | 1.000 | 3.000 | . | . |
| 1992 MAY | BDL | 5.500 | . | . | 3.000 | 5.000 |
| 1992 JUL | BDL | 3.000 | 1.500 | 3.500 | . | . |
| 1992 OCT | .500 <T | 2.000 | 1.000 <T | 3.500 | . | . |
| CONDUCTIVITY (UMHO/CM ) | | | DET'N LIMIT = 1.0 | | GUIDELINE = 400 (F2) | |
| 1991 FEB | 268 | 271 | . | . | 272 | . |
| 1991 APR | 275 | 290 | 289 | 294 | . | . |
| 1991 JUN | 269 | 273 | 275 | 281 | 275 | . |
| 1991 AUG | 289 | 293 | 295 | . | 290 | . |
| 1991 OCT | 286 | 287 | 287 | . | 283 | . |
| 1991 DEC | 252 | 253 | 256 | . | 257 | 259 |
| 1992 FEB | 278 | 281 | 277 | 283 | . | . |
| 1992 MAY | 273 | 277 | . | . | 278 | 278 |
| 1992 JUL | 276 | 283 | 283 | 285 | . | . |
| 1992 OCT | 240 | 249 | 253 | 252 | . | . |
| DISS ORG CARBON (MG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 5.0 (A3) | |
| 1991 FEB | 1.900 | 1.500 | . | . | 1.500 | . |
| 1991 APR | 2.000 | 1.600 | 1.500 | 2.500 | . | . |
| 1991 JUN | 1.800 | 1.500 | 1.500 | 2.000 | 1.300 | . |
| 1991 AUG | 2.000 | 1.900 | 1.700 | . | 1.600 | . |
| 1991 OCT | 2.000 | 1.600 | 1.400 | . | 1.300 | . |
| 1991 DEC | 1.700 | 1.200 | 1.000 | . | 1.100 | 1.000 |
| 1992 FEB | 1.800 | 1.500 | 1.500 | 1.700 | . | . |
| 1992 MAY | 1.900 | 1.700 | . | . | 1.500 | 1.600 |
| 1992 JUL | 1.800 | 1.600 | 1.500 | 2.200 | . | . |
| 1992 OCT | 1.800 | 1.500 | 1.400 | 1.600 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (LABORATORY) | | | | | | |
| FLUORIDE (MG/L ) | | | DET'N LIMIT = 0.01 | | GUIDELINE = 1.5 (A1) | |
| 1991 FEB | .100 | .900 | . | . | .880 | . |
| 1991 APR | .100 | .880 | .860 | .880 | . | . |
| 1991 JUN | .120 | 1.040 | 1.040 | 1.040 | 1.020 | . |
| 1991 AUG | .080 | 1.060 | 1.000 | . | 1.020 | . |
| 1991 OCT | .120 | .120 | .160 | . | .140 | . |
| 1991 DEC | .100 | .900 | .860 | . | .840 | .840 |
| 1992 FEB | .100 | .980 | .960 | .980 | . | . |
| 1992 MAY | .100 | 1.020 | . | . | 1.000 | 1.020 |
| 1992 JUL | .100 | 1.020 | .960 | .980 | . | . |
| 1992 OCT | .100 | 1.020 | .980 | .980 | . | . |
| HARDNESS (MG/L ) | | | DET'N LIMIT = 0.5 | | GUIDELINE = 80-100 (A4) | |
| 1991 FEB | 123.000 | 120.000 | . | . | 125.000 | . |
| 1991 APR | 118.500 | 123.700 | 122.200 | 121.700 | . | . |
| 1991 JUN | 121.000 | 122.000 | 124.000 | 124.000 | 125.000 | . |
| 1991 AUG | 129.000 | 130.000 | 131.000 | . | 127.000 | . |
| 1991 OCT | 122.900 | 121.400 | 121.600 | . | 118.900 | . |
| 1991 DEC | 110.800 | 111.200 | 108.600 | . | 110.100 | 110.700 |
| 1992 FEB | 121.200 | 123.100 | 117.700 | 121.900 | . | . |
| 1992 MAY | 120.000 | 119.000 | . | . | 122.000 | 122.000 |
| 1992 JUL | 119.000 | 120.000 | 120.000 | 121.000 | . | . |
| 1992 OCT | 106.720 | 108.650 | 109.890 | 107.860 | . | . |
| IONCAL (DMNSLESS ) | | | DET'N LIMIT = N/A | | GUIDELINE = N/A | |
| 1991 FEB | 2.792 | 2.245 | . | . | 5.046 | . |
| 1991 APR | 3.558 | 1.029 | 1.244 | 3.236 | . | . |
| 1991 JUN | 2.451 NAF | 1.321 NAF | 1.822 NAF | .663 NAF | .925 NAF | . |
| 1991 AUG | .565 | 1.232 | 1.967 | . | .079 | . |
| 1991 OCT | 1.214 | 1.936 | 1.873 | . | 2.470 | . |
| 1991 DEC | 1.990 | 1.104 | 1.126 | . | .903 | .050 |
| 1992 FEB | 3.778 | 7.268 | .475 | 3.765 | . | . |
| 1992 MAY | .028 NAF | .527 NAF | . | . | 3.219 NAF | 3.058 NAF |
| 1992 JUL | 1.625 | .614 | .695 | .603 | . | . |
| 1992 OCT | 1.312 | .701 | .107 | 3.661 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (LABORATORY) | | | | | | |
| POTASSIUM (MG/L ) | | | DET'N LIMIT = 0.01 | | GUIDELINE = 10 (F2) | |
| 1991 FEB | 1.450 | 1.350 | . | . | 1.350 | . |
| 1991 APR | 1.770 | 1.340 | 1.340 | 1.520 | . | . |
| 1991 JUN | 1.350 | 1.350 | 1.300 | 1.850 | 1.300 | . |
| 1991 AUG | 1.350 | 1.400 | 1.350 | . | 1.350 | . |
| 1991 OCT | 1.600 | 1.380 | 1.360 | . | 1.330 | . |
| 1991 DEC | 1.510 | 1.160 | 1.100 | . | 1.110 | 1.130 |
| 1992 FEB | 1.360 | 1.400 | 1.280 | 1.420 | . | . |
| 1992 MAY | 1.369 | 1.378 | . | . | 1.371 | 1.380 |
| 1992 JUL | 1.360 | 1.390 | 1.410 | 1.600 | . | . |
| 1992 OCT | 1.207 | 1.183 | 1.198 | 1.243 | . | . |
| LANGELIERS INDEX (DMNSLESS ) | | | DET'N LIMIT = N/A | | GUIDELINE = N/A | |
| 1991 FEB | .330 | .120 | . | . | .242 | . |
| 1991 APR | .330 | -.038 | .039 | .065 | . | . |
| 1991 JUN | .275 | .170 | -.065 | -.039 | .130 | . |
| 1991 AUG | .355 | .320 | .322 | . | .334 | . |
| 1991 OCT | .314 | .199 | .181 | . | .213 | . |
| 1991 DEC | .434 | .131 | -.015 | . | .118 | .123 |
| 1992 FEB | .391 | .360 | .285 | .337 | . | . |
| 1992 MAY | .374 | .161 | . | . | .287 | .301 |
| 1992 JUL | .488 | .285 | .257 | .212 | . | . |
| 1992 OCT | .269 | -.019 | .000 | -.007 | . | . |
| MAGNESIUM (MG/L ) | | | DET'N LIMIT = 0.1 | | GUIDELINE = 30.0 (F2) | |
| 1991 FEB | 8.700 | 8.600 | . | . | 8.500 | . |
| 1991 APR | 8.400 | 8.450 | 8.650 | 8.500 | . | . |
| 1991 JUN | 7.400 | 7.400 | 7.700 | 7.700 | 7.400 | . |
| 1991 AUG | 8.200 | 8.500 | 8.500 | . | 8.300 | . |
| 1991 OCT | 8.700 | 8.550 | 8.500 | . | 8.200 | . |
| 1991 DEC | 8.000 | 7.800 | 8.350 | . | 8.150 | 8.250 |
| 1992 FEB | 8.600 | 8.500 | 8.450 | 8.550 | . | . |
| 1992 MAY | 8.520 | 8.530 | . | . | 8.490 | 8.540 |
| 1992 JUL | 8.440 | 8.410 | 8.400 | 8.540 | . | . |
| 1992 OCT | 7.970 | 8.070 | 8.110 | 8.000 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (LABORATORY) | | | | | | |
| SODIUM (MG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 200 (A4) | |
| 1991 FEB | 7.400 | 7.400 | . | . | 7.800 | . |
| 1991 APR | 7.600 | 7.600 | 8.000 | 8.000 | . | . |
| 1991 JUN | 8.200 | 8.200 | 8.000 | 9.000 | 8.000 | . |
| 1991 AUG | 8.200 | 8.000 | 8.200 | . | 8.000 | . |
| 1991 OCT | 8.200 | 8.100 | 8.000 | . | 8.000 | . |
| 1991 DEC | 6.000 | 5.400 | 5.800 | . | 6.100 | 6.000 |
| 1992 FEB | 8.200 | 8.100 | 7.500 | 8.300 | . | . |
| 1992 MAY | 8.290 | 8.380 | . | . | 8.380 | 8.440 |
| 1992 JUL | 8.280 | 8.390 | 8.370 | 8.700 | . | . |
| 1992 OCT | 6.460 | 6.520 | 6.660 | 6.630 | . | . |
| AMMONIUM TOTAL (MG/L ) | | | DET'N LIMIT = 0.002 | | GUIDELINE = 0.05 (F2) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | .014 | BDL | .002 <T | .018 | . | . |
| 1991 JUN | .004 <T | BDL | .002 <T | .008 <T | .004 <T | . |
| 1991 AUG | .058 | BDL | .004 <T | . | .006 <T | . |
| 1991 OCT | BDL | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | .002 <T | .002 <T |
| 1992 FEB | .002 <T | BDL | BDL | .008 <T | . | . |
| 1992 MAY | .002 <T | .004 <T | . | . | .004 <T | .002 <T |
| 1992 JUL | BDL | .002 <T | .006 <T | .002 <T | . | . |
| 1992 OCT | .002 <T | BDL | .004 <T | .012 | . | . |
| NITRITE (MG/L ) | | | DET'N LIMIT = 0.001 | | GUIDELINE = 1.0 (A1) | |
| 1991 FEB | .001 <T | BDL | . | . | BDL | . |
| 1991 APR | .012 | BDL | BDL | .001 <T | . | . |
| 1991 JUN | .001 <T | BDL | BDL | .002 <T | .001 <T | . |
| 1991 AUG | .021 | BDL | BDL | . | .001 <T | . |
| 1991 OCT | .009 | BDL | BDL | . | .001 <T | . |
| 1991 DEC | .011 | BDL | BDL | . | BDL | .001 <T |
| 1992 FEB | .002 <T | BDL | .001 <T | .002 <T | . | . |
| 1992 MAY | .002 <T | .002 <T | . | . | .004 <T | .003 <T |
| 1992 JUL | .002 <T | BDL | .002 <T | .004 <T | . | . |
| 1992 OCT | .008 | BDL | .002 <T | .004 <T | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (LABORATORY) | | | | | | |
| NITRATE (TOTAL) (MG/L ) | | | DET'N LIMIT = 0.005 | | GUIDELINE = 10.0 (A1) | |
| 1991 FEB | .410 | .420 | . | . | .410 | . |
| 1991 APR | .645 | .615 | .555 | .555 | . | . |
| 1991 JUN | .160 | .175 | .180 | .200 | .200 | . |
| 1991 AUG | .310 | .275 | .320 | . | .265 | . |
| 1991 OCT | .135 | .140 | .145 | . | .140 | . |
| 1991 DEC | .225 | .225 | .220 | . | .230 | .225 |
| 1992 FEB | .285 | .295 | .320 | .310 | . | . |
| 1992 MAY | .200 | .240 | . | . | .250 | .245 |
| 1992 JUL | .215 | .190 | .185 | .220 | . | . |
| 1992 OCT | .340 | .315 | .300 | .305 | . | . |
| NITROGEN TOT KJELD (MG/L ) | | | DET'N LIMIT = 0.02 | | GUIDELINE = N/A | |
| 1991 FEB | .220 | .130 | . | . | .130 | . |
| 1991 APR | .210 | .160 | .110 | .180 | . | . |
| 1991 JUN | .210 | .250 | .250 | .380 | .130 | . |
| 1991 AUG | .230 | .160 | .150 | . | .140 | . |
| 1991 OCT | .400 | .140 | .140 | . | .150 | . |
| 1991 DEC | .240 | .090 <T | .100 | . | .080 <T | .100 |
| 1992 FEB | .260 | .140 | .130 | .200 | . | . |
| 1992 MAY | .230 | .150 | . | . | .160 | .180 |
| 1992 JUL | .200 | .140 | .130 | .230 | . | . |
| 1992 OCT | .200 | .130 | .120 | .160 | . | . |
| PH (DMNSLESS ) | | | DET'N LIMIT = N/A | | GUIDELINE = 6.5-8.5 (A4) | |
| 1991 FEB | 8.240 | 8.090 | . | . | 8.180 | . |
| 1991 APR | 8.250 | 7.930 | 8.010 | 8.030 | . | . |
| 1991 JUN | 8.150 | 8.100 | 7.860 | 7.870 | 8.030 | . |
| 1991 AUG | 8.200 | 8.210 | 8.210 | . | 8.230 | . |
| 1991 OCT | 8.230 | 8.160 | 8.130 | . | 8.170 | . |
| 1991 DEC | 8.410 | 8.180 | 8.060 | . | 8.170 | 8.170 |
| 1992 FEB | 8.380 | 8.320 | 8.270 | 8.290 | . | . |
| 1992 MAY | 8.300 | 8.130 | . | . | 8.250 | 8.260 |
| 1992 JUL | 8.420 | 8.260 | 8.230 | 8.180 | . | . |
| 1992 OCT | 8.280 | 8.040 | 8.050 | 8.050 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (LABORATORY) | | | | | | |
| PHOSPHORUS FIL REACT (MG/L ) | | | DET'N LIMIT = 0.0005 | | GUIDELINE = N/A | |
| 1991 FEB | .005 | .002 <T | . | . | . | . |
| 1991 APR | .017 | .002 | . | . | . | . |
| 1991 JUN | .001 <T | .002 <T | . | . | . | . |
| 1991 AUG | .002 | .003 | . | . | . | . |
| 1991 OCT | .024 | .000 <T | . | . | . | . |
| 1991 DEC | .028 | .001 <T | . | . | . | . |
| 1992 FEB | .008 | .002 <T | . | . | . | . |
| 1992 MAY | BDL | .001 <T | . | . | . | . |
| 1992 JUL | .005 | .002 <T | . | . | . | . |
| 1992 OCT | .001 <T | .002 <T | . | . | . | . |
| PHOSPHORUS TOTAL (MG/L ) | | | DET'N LIMIT = 0.002 | | GUIDELINE = 0.40 (F2) | |
| 1991 FEB | .016 | BDL | . | . | . | . |
| 1991 APR | .018 | .003 <T | . | . | . | . |
| 1991 JUN | .010 | .002 <T | . | . | . | . |
| 1991 AUG | .036 | .004 <T | . | . | . | . |
| 1991 OCT | .120 | .002 <T | . | . | . | . |
| 1991 DEC | .053 | .003 <T | . | . | . | . |
| 1992 FEB | .018 | .003 <T | . | . | . | . |
| 1992 MAY | .025 | .005 <T | . | . | . | . |
| 1992 JUL | .022 | .005 <T | . | . | . | . |
| 1992 OCT | .012 | .004 <T | . | . | . | . |
| RESIDUE FILTRATE (MG/L ) | | | DET'N LIMIT = N/A | | GUIDELINE = 500 (A3) | |
| 1991 FEB | 174.000 CRO | 176.000 CRO | . | . | 177.000 CRO | . |
| 1991 APR | 179.000 CRO | 189.000 CRO | 188.000 CRO | 191.000 CRO | . | . |
| 1991 JUN | 175.000 CRO | 177.000 CRO | 179.000 CRO | 183.000 CRO | 179.000 CRO | . |
| 1991 AUG | 188.000 CRO | 190.000 CRO | 192.000 CRO | . | 189.000 CRO | . |
| 1991 OCT | 186.000 CRO | 187.000 CRO | 187.000 CRO | . | 184.000 CRO | . |
| 1991 DEC | 164.000 CRO | 164.000 CRO | 166.000 CRO | . | 167.000 CRO | 168.000 CRO |
| 1992 FEB | 181.000 CRO | 183.000 CRO | 180.000 CRO | 184.000 CRO | . | . |
| 1992 MAY | 177.000 CRO | 180.000 CRO | . | . | 181.000 CRO | 181.000 CRO |
| 1992 JUL | 179.000 CRO | 184.000 CRO | 184.000 CRO | 185.000 CRO | . | . |
| 1992 OCT | 156.000 CRO | 162.000 CRO | 164.000 CRO | 164.000 CRO | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHEMISTRY (LABORATORY) | | | | | | |
| SULPHATE (MG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 500 (A3) | |
| 1991 FEB | 21.620 | 26.280 | . | . | 26.250 | . |
| 1991 APR | 23.470 | 34.330 | 32.810 | 33.140 | . | . |
| 1991 JUN | 23.010 | 27.700 | 27.510 | 27.670 | 27.410 | . |
| 1991 AUG | 23.880 | 27.900 | 27.460 | . | 26.820 | . |
| 1991 OCT | 24.480 | 29.910 | 28.270 | . | 26.920 | . |
| 1991 DEC | 19.440 | 27.220 | 27.140 | . | 27.170 | 26.880 |
| 1992 FEB | 22.330 | 25.110 | 25.530 | 25.440 | . | . |
| 1992 MAY | 22.640 | 26.810 | . | . | 26.090 | 26.440 |
| 1992 JUL | 23.320 | 29.560 | 29.130 | 28.660 | . | . |
| 1992 OCT | 19.610 | 24.220 | 24.630 | 23.210 | . | . |
| TURBIDITY (FTU ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 1.0 (A1) | |
| 1991 FEB | 5.700 RRV | .890 | . | . | .950 | . |
| 1991 APR | 39.000 | .620 | .210 | .840 | . | . |
| 1991 JUN | 9.000 | .890 | .190 <T | 1.190 RRV | .520 | . |
| 1991 AUG | 17.000 | 2.600 RRV | .510 | . | .440 | . |
| 1991 OCT | 88.000 | .770 | .160 <T | . | .180 <T | . |
| 1991 DEC | 47.000 | .650 | .280 | . | .280 | .380 |
| 1992 FEB | 7.500 | 1.680 RRV | .360 | .660 | . | . |
| 1992 MAY | 23.000 | 1.590 RRV | . | . | .630 | 1.170 RRV |
| 1992 JUL | 15.000 | 2.900 RRV | .250 | .940 | . | . |
| 1992 OCT | 7.500 | 2.100 RRV | .410 | .890 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| SILVER (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = N/A | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | BDL | . | . |
| 1991 JUN | BDL | BDL | BDL | .080 <T | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | BDL | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | BDL |
| 1992 FEB | BDL | BDL | BDL | BDL | . | . |
| 1992 MAY | BDL | BDL | . | . | BDL | BDL |
| 1992 JUL | BDL | BDL | BDL | BDL | . | . |
| 1992 OCT | BDL | BDL | .060 <T | .070 <T | . | . |
| ALUMINUM (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 100 (A4) | |
| 1991 FEB | 56.000 | 39.000 | . | . | 23.000 | . |
| 1991 APR | 260.000 | 46.000 | 28.000 | 38.000 | . | . |
| 1991 JUN | 87.000 | 68.000 | 40.000 | 46.000 | 38.000 | . |
| 1991 AUG | 120.000 | 150.000 | 100.000 | . | 130.000 | . |
| 1991 OCT | 550.000 | 170.000 | 1.400 | . | .810 <T | . |
| 1991 DEC | 350.000 | 50.000 | 32.000 | . | 31.000 | 39.000 |
| 1992 FEB | 83.000 | 69.000 | 27.000 | 33.000 | . | . |
| 1992 MAY | 100.000 | 110.000 | . | . | 52.000 | 79.000 |
| 1992 JUL | 84.000 | 240.000 | 110.000 | 110.000 | . | . |
| 1992 OCT | 77.000 | 200.000 | 99.000 | 84.000 | . | . |
| ARSENIC (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 25 (A1) | |
| 1991 FEB | .220 <T | .730 <T | . | . | .450 <T | . |
| 1991 APR | .610 <T | .380 <T | .230 <T | .250 <T | . | . |
| 1991 JUN | .610 <T | .590 <T | .320 <T | .370 <T | .320 <T | . |
| 1991 AUG | 1.200 | .940 <T | .800 <T | . | .740 <T | . |
| 1991 OCT | 3.300 | .520 <T | .200 <T | . | BDL | . |
| 1991 DEC | 1.100 | .670 <T | .510 <T | . | .470 <T | .550 <T |
| 1992 FEB | .980 <T | .650 <T | .590 <T | .620 <T | . | . |
| 1992 MAY | .630 <T | .800 <T | . | . | .590 <T | .610 <T |
| 1992 JUL | .710 <T | 1.100 | .650 <T | .620 <T | . | . |
| 1992 OCT | 1.100 | 1.200 | .750 <T | .870 <T | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| BARIUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 1000 (A2) | |
| 1991 FEB | 20.000 | 19.000 | . | . | 19.000 | . |
| 1991 APR | 23.000 | 21.000 | 21.000 | 23.000 | . | . |
| 1991 JUN | 22.000 | 20.000 | 22.000 | 22.000 | 21.000 | . |
| 1991 AUG | 24.000 | 23.000 | 23.000 | . | 22.000 | . |
| 1991 OCT | 42.000 | 21.000 | 3.600 | . | 4.200 | . |
| 1991 DEC | 20.000 | 17.000 | 18.000 | . | 19.000 | 20.000 |
| 1992 FEB | 22.000 | 20.000 | 19.000 | 21.000 | . | . |
| 1992 MAY | 22.000 | 21.000 | . | . | 21.000 | 23.000 |
| 1992 JUL | 22.000 | 20.000 | 22.000 | 23.000 | . | . |
| 1992 OCT | 17.000 | 17.000 | 18.000 | 18.000 | . | . |
| BORON (UG/L ) | | | DET'N LIMIT = 2.00 | | GUIDELINE = 5000 (A1) | |
| 1991 FEB | 19.000 <T | 19.000 <T | . | . | 19.000 <T | . |
| 1991 APR | 26.000 | 25.000 | 27.000 | 29.000 | . | . |
| 1991 JUN | 19.000 <T | 19.000 <T | 21.000 | 23.000 | 20.000 <T | . |
| 1991 AUG | 23.000 | 21.000 | 21.000 | . | 21.000 | . |
| 1991 OCT | 36.000 | 29.000 | 27.000 | . | 27.000 | . |
| 1991 DEC | 17.000 <T | 17.000 <T | 21.000 | . | 21.000 | 21.000 |
| 1992 FEB | 24.000 | 24.000 | 21.000 | 28.000 | . | . |
| 1992 MAY | 22.000 | 22.000 | . | . | 22.000 | 23.000 |
| 1992 JUL | 27.000 | 28.000 | 29.000 | 28.000 | . | . |
| 1992 OCT | 18.000 <T | 20.000 <T | 19.000 <T | 26.000 | . | . |
| BERYLLIUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 6800 (D4) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | BDL | . | . |
| 1991 JUN | BDL | BDL | BDL | BDL | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | .070 <T | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | BDL |
| 1992 FEB | BDL | BDL | BDL | BDL | . | . |
| 1992 MAY | .070 <T | .090 <T | . | . | .080 <T | .070 <T |
| 1992 JUL | BDL | BDL | BDL | BDL | . | . |
| 1992 OCT | BDL | BDL | BDL | BDL | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| CADMIUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 5.0 (A1) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | .100 <T | . | . |
| 1991 JUN | BDL | BDL | BDL | .250 <T | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | .070 <T | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | .070 <T |
| 1992 FEB | BDL | BDL | BDL | .290 <T | . | . |
| 1992 MAY | BDL | BDL | . | . | BDL | .110 <T |
| 1992 JUL | BDL | BDL | BDL | .330 <T | . | . |
| 1992 OCT | .060 <T | .070 <T | .090 <T | .350 <T | . | . |
| COBALT (UG/L ) | | | DET'N LIMIT = 0.02 | | GUIDELINE = N/A | |
| 1991 FEB | .180 <T | .130 <T | . | . | .140 <T | . |
| 1991 APR | .580 <T | .160 <T | .130 <T | .320 <T | . | . |
| 1991 JUN | .310 <T | .200 <T | .250 <T | .250 <T | .210 <T | . |
| 1991 AUG | .350 <T | .120 <T | .110 <T | . | .120 <T | . |
| 1991 OCT | 1.400 | .080 <T | BDL | . | BDL | . |
| 1991 DEC | .490 <T | .100 <T | .090 <T | . | .060 <T | .120 <T |
| 1992 FEB | .230 <T | .100 <T | .080 <T | .190 <T | . | . |
| 1992 MAY | .260 <T | .170 <T | . | . | .150 <T | .220 <T |
| 1992 JUL | .270 <T | .130 <T | .150 <T | .350 <T | . | . |
| 1992 OCT | .380 <T | .400 <T | .290 <T | .360 <T | . | . |
| CHROMIUM (UG/L ) | | | DET'N LIMIT = 0.50 | | GUIDELINE = 50.0 (A1) | |
| 1991 FEB | .540 <T | .900 <T | . | . | .770 <T | . |
| 1991 APR | 3.900 <T | 3.400 <T | 3.800 <T | 3.800 <T | . | . |
| 1991 JUN | 1.000 <T | 1.300 <T | 1.700 <T | 1.400 <T | .720 <T | . |
| 1991 AUG | 1.800 <T | 1.600 <T | 1.600 <T | . | 1.400 <T | . |
| 1991 OCT | 4.900 <T | 2.900 <T | .580 <T | . | BDL | . |
| 1991 DEC | 1.200 <T | 1.100 <T | 2.600 <T | . | 2.500 <T | 2.300 <T |
| 1992 FEB | .950 <T | 1.000 <T | .680 <T | 1.400 <T | . | . |
| 1992 MAY | .570 <T | .680 <T | . | . | BDL | BDL |
| 1992 JUL | 1.200 <T | 1.400 <T | 1.500 <T | .820 <T | . | . |
| 1992 OCT | .600 <T | 1.300 <T | 1.500 <T | 1.100 <T | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| COPPER (UG/L ) | | | DET'N LIMIT = 0.50 | | GUIDELINE = 1000 (A3) | |
| 1991 FEB | 1.600 <T | 1.100 <T | . | . | 15.000 | . |
| 1991 APR | 2.400 <T | 1.000 <T | 6.600 | 93.000 | . | . |
| 1991 JUN | 2.200 <T | 1.200 <T | 11.000 | 130.000 | 9.000 | . |
| 1991 AUG | 3.500 <T | 1.600 <T | 12.000 | . | 8.100 | . |
| 1991 OCT | 8.700 | 1.500 <T | 3.200 <T | . | 4.800 <T | . |
| 1991 DEC | 2.900 <T | 1.100 <T | 5.800 | . | 8.800 | 66.000 |
| 1992 FEB | 2.200 <T | 2.600 <T | 6.500 | 150.000 | . | . |
| 1992 MAY | 2.200 <T | 1.100 <T | . | . | 23.000 | 91.000 |
| 1992 JUL | 3.200 <T | 1.800 <T | 5.800 | 89.000 | . | . |
| 1992 OCT | 2.200 <T | 1.400 <T | 5.900 | 46.000 | . | . |
| IRON (UG/L ) | | | DET'N LIMIT = 6.00 | | GUIDELINE = 300 (A3) | |
| 1991 FEB | 110.000 | 77.000 | . | . | 120.000 | . |
| 1991 APR | 710.000 | 120.000 | 66.000 | 180.000 | . | . |
| 1991 JUN | 260.000 | 110.000 | 82.000 | 330.000 | 100.000 | . |
| 1991 AUG | 560.000 | 120.000 | 65.000 | . | 97.000 | . |
| 1991 OCT | 1800.000 | 97.000 | BDL | . | BDL | . |
| 1991 DEC | 740.000 | 65.000 | 55.000 <T | . | 76.000 | 86.000 |
| 1992 FEB | 290.000 | 230.000 | 53.000 <T | 190.000 | . | . |
| 1992 MAY | 280.000 | 220.000 | . | . | 130.000 | 250.000 |
| 1992 JUL | 200.000 | 400.000 | 55.000 <T | 190.000 | . | . |
| 1992 OCT | 120.000 | 220.000 | 72.000 | 180.000 | . | . |
| MERCURY (UG/L ) | | | DET'N LIMIT = 0.02 | | GUIDELINE = 1.0 (A1) | |
| 1991 FEB | BDL | BDL | . | . | . | . |
| 1991 APR | .040 <T | BDL | . | . | . | . |
| 1991 JUN | BDL | BDL | . | . | . | . |
| 1991 AUG | BDL | BDL | . | . | . | . |
| 1991 OCT | BDL | BDL | . | . | . | . |
| 1991 DEC | BDL | BDL | . | . | . | . |
| 1992 FEB | BDL | BDL | . | . | . | . |
| 1992 MAY | BDL | BDL | . | . | . | . |
| 1992 JUL | BDL | BDL | . | . | . | . |
| 1992 OCT | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| MANGANESE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 50.0 (A3) | |
| 1991 FEB | 6.000 | .870 | . | . | 7.300 | . |
| 1991 APR | 32.000 | 2.200 | 11.000 | 18.000 | . | . |
| 1991 JUN | 11.000 | 1.900 | 13.000 | 26.000 | 14.000 | . |
| 1991 AUG | 47.000 | 2.600 | 9.800 | . | 15.000 | . |
| 1991 OCT | 900.000 | 2.200 | .180 <T | . | BDL | . |
| 1991 DEC | 47.000 | .830 | 12.000 | . | 9.900 | 12.000 |
| 1992 FEB | 19.000 | 6.700 | 11.000 | 19.000 | . | . |
| 1992 MAY | 20.000 | 4.000 | . | . | 6.500 | 15.000 |
| 1992 JUL | 19.000 | 9.800 | 13.000 | 24.000 | . | . |
| 1992 OCT | 7.900 | 2.900 | 19.000 | 29:000 | . | . |
| MOLYBDENUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = N/A | |
| 1991 FEB | 1.100 | 1.100 | . | . | 1.000 | . |
| 1991 APR | .760 | 1.500 | 1.500 | 1.400 | . | . |
| 1991 JUN | .880 | 1.100 | 1.100 | 1.100 | 1.100 | . |
| 1991 AUG | .770 | 1.100 | 1.200 | . | 1.100 | . |
| 1991 OCT | .820 | 1.500 | 1.400 | . | 1.400 | . |
| 1991 DEC | .700 | 1.100 | 1.100 | . | 1.000 | 1.100 |
| 1992 FEB | 1.100 | .910 | 1.200 | 1.200 | . | . |
| 1992 MAY | 1.200 | 1.200 | . | . | 1.200 | 1.100 |
| 1992 JUL | 1.000 | .870 | 1.100 | 1.100 | . | . |
| 1992 OCT | .950 | 1.100 | 1.000 | .930 | . | . |
| NICKEL (UG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 350 (D3) | |
| 1991 FEB | 1.900 <T | 1.700 <T | . | . | 1.900 <T | . |
| 1991 APR | 1.500 <T | BDL | .470 <T | 5.200 | . | . |
| 1991 JUN | 1.300 <T | .880 <T | 1.300 <T | 3.200 | 1.500 <T | . |
| 1991 AUG | 2.100 | 1.200 <T | 1.300 <T | . | 1.000 <T | . |
| 1991 OCT | 3.400 | BDL | BDL | . | BDL | . |
| 1991 DEC | 1.300 <T | BDL | BDL | . | BDL | 1.200 <T |
| 1992 FEB | BDL | BDL | BDL | 4.600 | . | . |
| 1992 MAY | 1.400 <T | .700 <T | . | . | .800 <T | 2.100 |
| 1992 JUL | 1.600 <T | 1.200 <T | 1.300 <T | 7.700 | . | . |
| 1992 OCT | 3.400 | 2.100 | 1.900 <T | 5.800 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| LEAD (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 10 (A1) | |
| 1991 FEB | .140 <T | .890 | . | . | .230 <T | . |
| 1991 APR | .750 | .990 | .560 | 7.200 | . | . |
| 1991 JUN | .240 <T | 1.700 | 1.200 | 15.000 | .210 <T | . |
| 1991 AUG | .520 | 2.700 | 1.600 | . | .260 <T | . |
| 1991 OCT | 2.500 | 2.500 | .080 <T | . | .060 <T | . |
| 1991 DEC | .940 | .470 <T | .750 | . | .110 <T | 2.600 |
| 1992 FEB | .360 <T | 3.000 | .830 | 25.000 | . | . |
| 1992 MAY | .350 <T | 1.800 | . | . | .340 <T | 9.300 |
| 1992 JUL | .330 <T | 8.000 | .960 | 26.000 | . | . |
| 1992 OCT | .190 <T | 3.400 | 2.300 | 13.000 | . | . |
| ANTIMONY (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 146 (D4) | |
| 1991 FEB | .800 | .580 | . | . | .790 | . |
| 1991 APR | .490 <T | .510 | .490 <T | .740 | . | . |
| 1991 JUN | .650 | .460 <T | .550 | .770 | .730 | . |
| 1991 AUG | .500 <T | .570 | .590 | . | .560 | . |
| 1991 OCT | .440 <T | .480 <T | .750 | . | .830 | . |
| 1991 DEC | .460 <T | .590 | .520 | . | .710 | .810 |
| 1992 FEB | .620 | .530 | .610 | .890 | . | . |
| 1992 MAY | .400 <T | .410 <T | . | . | .560 | .790 |
| 1992 JUL | .570 | .460 <T | .420 <T | .910 | . | . |
| 1992 OCT | .470 <T | .640 | .570 | .540 | . | . |
| SELENIUM (UG/L ) | | | DET'N LIMIT = 1.00 | | GUIDELINE = 10 (A1) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | 1.300 <T | 2.500 <T | 1.700 <T | . | . |
| 1991 JUN | BDL | BDL | BDL | BDL | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | 3.100 <T | 2.500 <T | 1.800 <T | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | BDL |
| 1992 FEB | BDL | BDL | BDL | BDL | . | . |
| 1992 MAY | BDL | BDL | . | . | BDL | BDL |
| 1992 JUL | BDL | 1.200 <T | BDL | BDL | . | . |
| 1992 OCT | BDL | 2.400 <T | 2.000 <T | 2.300 <T | . | . |

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| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| STRONTIUM (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = N/A | |
| 1991 FEB | 160.000 | 170.000 | . | . | 170.000 | . |
| 1991 APR | 180.000 | 170.000 | 170.000 | 180.000 | . | . |
| 1991 JUN | 150.000 | 140.000 | 150.000 | 150.000 | 150.000 | . |
| 1991 AUG | 160.000 | 160.000 | 160.000 | . | 160.000 | . |
| 1991 OCT | 170.000 | 160.000 | 45.000 | . | 52.000 | . |
| 1991 DEC | 130.000 | 130.000 | 130.000 | . | 130.000 | 140.000 |
| 1992 FEB | 160.000 | 160.000 | 150.000 | 160.000 | . | . |
| 1992 MAY | 150.000 | 150.000 | . | . | 150.000 | 150.000 |
| 1992 JUL | 150.000 | 160.000 | 160.000 | 160.000 | . | . |
| 1992 OCT | 130.000 | 130.000 | 140.000 | 140.000 | . | . |
| TITANIUM (UG/L ) | | | DET'N LIMIT = 0.50 | | GUIDELINE = N/A | |
| 1991 FEB | 4.000 <T | 2.600 <T | . | . | 2.600 <T | . |
| 1991 APR | 8.300 | 2.100 <T | 2.000 <T | 1.900 <T | . | . |
| 1991 JUN | 4.100 <T | 2.600 <T | 2.700 <T | 2.800 <T | 2.500 <T | . |
| 1991 AUG | 3.000 <T | .550 <T | .550 <T | . | .590 <T | . |
| 1991 OCT | 9.100 | 1.400 <T | .880 <T | . | .870 <T | . |
| 1991 DEC | 6.100 | 1.100 <T | 1.200 <T | . | 1.200 <T | 1.300 <T |
| 1992 FEB | 3.300 <T | 1.300 <T | 1.400 <T | 1.600 <T | . | . |
| 1992 MAY | 8.300 | 6.400 | . | . | 6.300 | 5.700 |
| 1992 JUL | 7.200 | 4.800 <T | 4.500 <T | 5.400 | . | . |
| 1992 OCT | 3.700 <T | 2.500 <T | 2.600 <T | 2.700 <T | . | . |
| THALLIUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 13 (D4) | |
| 41 SAMPLES | BDL | BDL | BDL | BDL | BDL | BDL |
| URANIUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 100 (A1) | |
| 1991 FEB | .370 <T | .290 <T | . | . | .210 <T | . |
| 1991 APR | .470 <T | .170 <T | .180 <T | .210 <T | . | . |
| 1991 JUN | .330 <T | .210 <T | .170 <T | .200 <T | .180 <T | . |
| 1991 AUG | .360 <T | .260 <T | .240 <T | . | .270 <T | . |
| 1991 OCT | .490 <T | .260 <T | .090 <T | . | .060 <T | . |
| 1991 DEC | .350 <T | .100 <T | .130 <T | . | .100 <T | .120 <T |
| 1992 FEB | .470 <T | .340 <T | .290 <T | .280 <T | . | . |
| 1992 MAY | .410 <T | .310 <T | . | . | .280 <T | .280 <T |
| 1992 JUL | .370 <T | .240 <T | .240 <T | .210 <T | . | . |
| 1992 OCT | .300 <T | .260 <T | .200 <T | .170 <T | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| METALS | | | | | | |
| VANADIUM (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = N/A | |
| 1991 FEB | .370 <T | .680 | . | . | .550 | . |
| 1991 APR | .540 | .660 | .170 <T | .230 <T | . | . |
| 1991 JUN | .340 <T | .490 <T | .350 <T | .470 <T | .420 <T | . |
| 1991 AUG | .620 | .680 | .550 | . | .650 | . |
| 1991 OCT | 2.000 | .510 | .220 <T | . | .360 <T | . |
| 1991 DEC | .910 | .600 | .300 <T | . | .300 <T | .320 <T |
| 1992 FEB | .360 <T | .610 | .280 <T | .450 <T | . | . |
| 1992 MAY | .240 <T | .320 <T | . | . | .190 <T | .780 |
| 1992 JUL | .330 <T | 1.100 | .370 <T | .530 | . | . |
| 1992 OCT | .470 <T | .680 | .390 <T | .430 <T | . | . |
| ZINC (UG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 5000 (A3) | |
| 1991 FEB | 1.800 <T | 1.400 <T | . | . | 7.300 | . |
| 1991 APR | 4.700 | 6.100 | 43.000 | 630.000 | . | . |
| 1991 JUN | 6.000 | 2.700 | 53.000 | 840.000 | 7.100 | . |
| 1991 AUG | 3.000 | .860 <T | 31.000 | . | 4.100 | . |
| 1991 OCT | 11.000 | 1.200 <T | .700 <T | . | .560 <T | . |
| 1991 DEC | 4.100 | .890 <T | 29.000 | . | 6.600 | 61.000 |
| 1992 FEB | 9.300 | 2.600 | 29.000 | 500.000 | . | . |
| 1992 MAY | 4.700 | 2.600 | . | . | 14.000 | 44.000 |
| 1992 JUL | 3.500 | 2.000 <T | 45.000 | 390.000 | . | . |
| 1992 OCT | 2.400 | 2.400 | 45.000 | 450.000 | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHLOROAROMATICS | | | | | | |
| HEXACHLOROBUTADIENE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 450 (D4) | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 123-TRICHLOROBENZENE (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1234-TETCLOROBENZENE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1235-TETCLOROBENZENE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 124-TRICHLOROBENZENE (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = 10000 (I) | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1245-TETCLOROBENZENE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 38000 (D4) | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 135-TRICHLOROBENZENE (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| HEXACHLOROBENZENE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 10 (C1) | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| HEXACHLOROETHANE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 1900 (D4) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | 10.000 <T | . | . | . |
| 1991 JUN | BDL | BDL | BDL | . | BDL | . |
| 1991 AUG | !AW | !AW | !AW | . | !AW | . |
| 1991 OCT | !AW | !AW | !AW | . | !AW | . |
| 1991 DEC | BDL | 5.000 <T | BDL | . | BDL | . |
| 1992 FEB | BDL | 4.000 <T | 4.000 <T | . | . | . |
| 1992 MAY | BDL | 2.000 <T | . | . | 2.000 <T | . |
| 1992 OCT | BDL | 2.000 <T | 3.000 <T | . | . | . |
| OCTACHLOROSTYRENE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHLOROAROMATICS | | | | | | |
| PENTACHLOROBENZENE. (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 74000 (D4) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| 236-TRICHLOROTOLUENE (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| 245-TRICHLOROTOLUENE (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| 26A-TRICHLOROTOLUENE (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| CHLOROPHENOLS | | | | | | |
| 234-TRICHLOROPHENOL (NG/L ) | | | DET'N LIMIT = 100.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 2345-TETCHLOROPHENOL (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 2356-TETCHLOROPHENOL (NG/L ) | | | DET'N LIMIT = 10.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 245-TRICHLOROPHENOL (NG/L ) | | | DET'N LIMIT = 100.0 | | GUIDELINE = 2600000 (D4) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 246-TRICHLOROPHENOL (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 5000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| PENTACHLOROPHENOL (NG/L ) | | | DET'N LIMIT = 10.00 | | GUIDELINE = 60000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| PESTICIDES AND PCB | | | | | | |
| ALDRIN (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 700 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| ALPHA BHC (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 700 (G) | |
| 1991 FEB | BDL | BDL | | | BDL | |
| 1991 APR | BDL | 3.000 <T | BDL | | | |
| 1991 JUN | BDL | BDL | BDL | | BDL | |
| 1991 AUG | !AW | !AW | !AW | | !AW | |
| 1991 OCT | !AW | !AW | !AW | | !AW | |
| 1991 DEC | 1.000 <T | 1.000 <T | 1.000 <T | | 1.000 <T | |
| 1992 FEB | BDL | BDL | BDL | | | |
| 1992 MAY | BDL | BDL | | | BDL | |
| 1992 OCT | BDL | BDL | BDL | | | |
| BETA BHC (NG/L ) | | | DET'N LIMIT = 1.00 | | GUIDELINE = 300 (G) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| LINDANE (GAMMA BHC) (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 4000 (A1) | |
| 1991 FEB | 1.000 <T | BDL | | | BDL | |
| 1991 APR | BDL | 1.000 <T | BDL | | | |
| 1991 JUN | BDL | BDL | BDL | | BDL | |
| 1991 AUG | !AW | !AW | !AW | | !AW | |
| 1991 OCT | !AW | !AW | !AW | | !AW | |
| 1991 DEC | BDL | BDL | BDL | | BDL | |
| 1992 FEB | BDL | BDL | BDL | | | |
| 1992 MAY | BDL | BDL | | | BDL | |
| 1992 OCT | BDL | BDL | BDL | | | |
| ALPHA CHLORDANE (NG/L ) | | | DET'N LIMIT = 2.000 | | GUIDELINE = 7000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| GAMMA CHLORDANE (NG/L ) | | | DET'N LIMIT = 2.00 | | GUIDELINE = 7000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| DIELDRIN (NG/L ) | | | DET'N LIMIT = 2.00 | | GUIDELINE = 700 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| METHOXYCHLOR (NG/L ) | | | DET'N LIMIT = 5.0 | | GUIDELINE = 900000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| PESTICIDES AND PCB | | | | | | |
| ENDOSULFAN 1 (NG/L ) | | | DET'N LIMIT = 2.00 | | GUIDELINE = 74000 (D4) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| ENDOSULFAN II (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = 74000 (D4) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| ENDRIN (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = 1600 (D3) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| ENDOSULFAN SULPHATE (NG/L ) | | | DET'N LIMIT = 5.00 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| HEPTACHLOR EPOXIDE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 3000 (A1) | |
| 16 SAMPLES | BDL | BDL | BDL | | BDL | |
| HEPTACHLOR (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 3000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| MIREX (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| OXYCHLORDANE (NG/L ) | | | DET'N LIMIT = 2.000 | | GUIDELINE = N/A | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| O,P-DDT (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = 30000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| PCB (NG/L ) | | | DET'N LIMIT = 20.00 | | GUIDELINE = 3000 (A2) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| P,P-DDD (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = 30000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |
| P,P-DDE (NG/L ) | | | DET'N LIMIT = 1.000 | | GUIDELINE = 30000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | | BDL | |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| PESTICIDES AND PCB | | | | | | |
| P,P-DDT (NG/L ) | | | DET'N LIMIT = 5.000 | | GUIDELINE = 30000 (A1) | |
| 23 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| TOXAPHENE (NG/L ) | | | DET'N LIMIT = 500.0 | | GUIDELINE = 5000 (A1) | |
| 20 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| AMETRINE (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = 300000 (D3) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| ATRAZINE (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = 60000 (A2) | |
| 1991 FEB | !PE | !PE | . | . | . | . |
| 1991 APR | 130.000 <T | 80.000 <T | . | . | . | . |
| 1991 JUN | 200.000 <T | 150.000 <T | . | . | . | . |
| 1991 AUG | !AW | !AW | . | . | . | . |
| 1991 OCT | !AW | !AW | . | . | . | . |
| 1991 DEC | 100.000 <T | 80.000 <T | . | . | . | . |
| 1992 FEB | 100.000 <T | 80.000 <T | . | . | . | . |
| 1992 MAY | BDL | 70.000 <T | . | . | . | . |
| 1992 OCT | 120.000 <T | 70.000 <T | . | . | . | . |
| ATRATONE (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = N/A | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| CYANAZINE (BLADEX) (NG/L ) | | | DET'N LIMIT = 100.0 | | GUIDELINE = 10000 (A2) | |
| 1991 FEB | !PE | !PE | . | . | . | . |
| 1991 APR | BDL | BDL | . | . | . | . |
| 1991 JUN | BDL | BDL | . | . | . | . |
| 1991 AUG | !AW | !AW | . | . | . | . |
| 1991 OCT | !AW | !AW | . | . | . | . |
| 1991 DEC | BDL | BDL | . | . | . | . |
| 1992 FEB | BDL | 110.000 <T | . | . | . | . |
| 1992 MAY | BDL | BDL | . | . | . | . |
| 1992 OCT | BDL | BDL | . | . | . | . |
| DESETHYL ATRAZINE (NG/L ) | | | DET'N LIMIT = 200.0 | | GUIDELINE = 60000 (A2) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| DESETHYL SIMAZINE (NG/L ) | | | DET'N LIMIT = 200.0 | | GUIDELINE = 10000 (A2) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| PESTICIDES AND PCB | | | | | | |
| PROMETONE (NG/L ) | | | DET'N LIMIT = 50.000 | | GUIDELINE = 52500 (D3) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| PROPAZINE (NG/L ) | | | DET'N LIMIT = 50.000 | | GUIDELINE = 700000 (D3) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| PROMETRYNE (NG/L ) | | | DET'N LIMIT = 50.000 | | GUIDELINE = 1000 (A2) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| METRIBUZIN (SENCOR) (NG/L ) | | | DET'N LIMIT = 100.0 | | GUIDELINE = 80000 (A1) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| SIMAZINE (NG/L ) | | | DET'N LIMIT = 50.00 | | GUIDELINE = 10000 (A2) | |
| 1991 FEB | !PE | !PE | . | . | . | . |
| 1991 APR | BDL | BDL | . | . | . | . |
| 1991 JUN | BDL | BDL | . | . | . | . |
| 1991 AUG | !AW | !AW | . | . | . | . |
| 1991 OCT | !AW | !AW | . | . | . | . |
| 1991 DEC | BDL | BDL | . | . | . | . |
| 1992 FEB | BDL | 50.000 <T | . | . | . | . |
| 1992 MAY | BDL | BDL | . | . | . | . |
| 1992 OCT | BDL | BDL | . | . | . | . |
| ALACHLOR (LASSO) (NG/L ) | | | DET'N LIMIT = 500.0 | | GUIDELINE = 5000 (A2) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |
| METOLACHLOR (NG/L ) | | | DET'N LIMIT = 500.0 | | GUIDELINE = 50000 (A2) | |
| 12 SAMPLES | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| PESTICIDES AND PCB HEXACLCYCLOPENTADIEN (NG/L ) | | DET'N LIMIT = 5.00 | | | GUIDELINE = 206000 (D4) | |
| 1991 FEB | BDL | 14.000 <T | . | . | 10.000 <T | . |
| 1991 APR | 97.000 | BDL | 56.000 | . | . | . |
| 1991 JUN | !QU | 15.000 <T | !QU | . | 6.000 <T | . |
| 1991 AUG | !AW | !AW | !AW | . | !AW | . |
| 1991 OCT | !AW | !AW | !AW | . | !AW | . |
| 1991 DEC | 7.000 <T | 11.000 <T | 13.000 <T | . | BDL | . |
| 1992 FEB | 16.000 <T | 16.000 <T | 14.000 <T | . | . | . |
| 1992 MAY | !QU | !QU | . | . | !QU | . |
| 1992 OCT | !QU | !QU | !QU | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| PHENOLICS (UG/L | PHENOLICS ) | | DET'N LIMIT = 0.2 | | GUIDELINE = N/A | |
| 1991 FEB | .400 <T | !PR | . | . | . | . |
| 1991 APR | .600 <T | .400 <T | . | . | . | . |
| 1991 JUN | BDL | BDL | . | . | . | . |
| 1991 AUG | BDL | .200 <T | . | . | . | . |
| 1991 OCT | 1.000 <T | .600 <T | . | . | . | . |
| 1991 DEC | 1.000 | .400 <T | . | . | . | . |
| 1992 FEB | BDL | BDL | . | . | . | . |
| 1992 MAY | BDL | BDL | . | . | . | . |
| 1992 JUL | BDL | BDL | . | . | . | . |
| 1992 OCT | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| POLYAROMATIC HYDROCARBONS | | | | | | |
| PHENANTHRENE (NG/L ) | | | DET'N LIMIT = 10.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| ANTHRACENE (NG/L ) | | | DET'N LIMIT = 1.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| FLUORANTHENE (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 42000 (D4) | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| PYRENE (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| BENZO(A)ANTHRACENE (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| CHRYSENE (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| DIMETH. BENZ(A)ANTHR (NG/L ) | | | DET'N LIMIT = 5.0 | | GUIDELINE = N/A | |
| 12 SAMPLES | BDL | BDL | BDL | | BDL | |
| BENZO(E) PYRENE (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| BENZO(B) FLUORANTHEN (NG/L ) | | | DET'N LIMIT = 10.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| PERYLENE (NG/L ) | | | DET'N LIMIT = 10.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| BENZO(K) FLUORANTHEN (NG/L ) | | | DET'N LIMIT = 1.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |
| BENZO(A) PYRENE (NG/L ) | | | DET'N LIMIT = 5.0 | | GUIDELINE = 10 (A1) | |
| 13 SAMPLES | BDL | BDL | BDL | | BDL | |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| POLYAROMATIC HYDROCARBONS | | | | | | |
| BENZO(G,H,I) PERYLEN (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| DIBENZO(A,H) ANTHRAC (NG/L ) | | | DET'N LIMIT = 10.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| INDENO(1,2,3-C,D) PY (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| BENZO(B) CHRYSENE (NG/L ) | | | DET'N LIMIT = 2.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| CORONENE (NG/L ) | | | DET'N LIMIT = 10.0 | | GUIDELINE = N/A | |
| 13 SAMPLES | BDL | BDL | BDL | . | BDL | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| SPECIFIC PESTICIDES | | | | | | |
| TOXAPHENE (NG/L ) | | | DET'N LIMIT = 500.0 | | GUIDELINE = 5000 (A1) | |
| 3 SAMPLES | BDL | BDL | . | . | BDL | . |
| 2,4,5-T (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = 280000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 2,4-D (NG/L ) | | | DET'N LIMIT = 100.0 | | GUIDELINE = 100000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 2,4-DB (NG/L ) | | | DET'N LIMIT = 200.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 2,4 D PROPIONIC ACID (NG/L ) | | | DET'N LIMIT = 100.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| DICAMBA (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = 120000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| 2,4,5-TP (SILVEX) (NG/L ) | | | DET'N LIMIT = 20.00 | | GUIDELINE = 10000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| DIAZINON (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 20000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| CHLORPYRIFOS (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| ETHION (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 35000 (G) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| MALATHION (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 190000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| MEVINPHOS (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| SPECIFIC PESTICIDES | | | | | | |
| METHYL PARATHION (NG/L ) | | | DET'N LIMIT = 50.0 | | GUIDELINE = 9000 (D3) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| METHYLTRITHION (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| PARATHION (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 50000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| PHORATE (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = 2000 (A2) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| RELDAN (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| RONNEL (NG/L ) | | | DET'N LIMIT = 20.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| CARBOFURAN (NG/L ) | | | DET'N LIMIT = 2000.0 | | GUIDELINE = 90000 (A1) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| CHLORPROPHAM (CIPC) (NG/L ) | | | DET'N LIMIT = 2000.0 | | GUIDELINE = 350000 (G) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| DIALLATE (NG/L ) | | | DET'N LIMIT = 2000.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| EPTAM (NG/L ) | | | DET'N LIMIT = 2000.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| IPC (NG/L ) | | | DET'N LIMIT = 2000.0 | | GUIDELINE = N/A | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |
| PROPOXUR (NG/L ) | | | DET'N LIMIT = 2000.0 | | GUIDELINE = 140000 (D3) | |
| 2 SAMPLES | BDL | BDL | . | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| SPECIFIC PESTICIDES | | | | | | |
| CARBARYL (NG/L ) | | | DET'N LIMIT = 200.0 | | GUIDELINE = 90000 (A1) | |
| 2 SAMPLES | BDL | BDL | | | | |
| BUTYLATE (NG/L ) | | | DET'N LIMIT = 200.0 | | GUIDELINE = 245000 (D3) | |
| 2 SAMPLES | BDL | BDL | | | | |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| VOLATILES | | | | | | |
| BENZENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 5 (A1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| TOLUENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 24 (A3) | |
| 1991 FEB | .050 <T | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | . | . | . |
| 1991 JUN | BDL | .050 <T | BDL | . | BDL | . |
| 1991 AUG | BDL | .050 <T | BDL | . | BDL | . |
| 1991 OCT | BDL | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | . |
| 1992 FEB | BDL | BDL | BDL | . | . | . |
| 1992 MAY | BDL | BDL | . | . | BDL | . |
| 1992 JUL | BDL | .050 <T | BDL | . | . | . |
| 1992 OCT | BDL | BDL | BDL | . | . | . |
| ETHYLBENZENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 2.4 (A3) | |
| 1991 FEB | .100 <T | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | . | . | . |
| 1991 JUN | .050 <T | .100 <T | BDL | . | BDL | . |
| 1991 AUG | BDL | .150 <T | .250 <T | . | .300 <T | . |
| 1991 OCT | .100 <T | .100 <T | .100 <T | . | BDL | . |
| 1991 DEC | .050 <T | .150 <T | .050 <T | . | .050 <T | . |
| 1992 FEB | .050 <T | .150 <T | BDL | . | . | . |
| 1992 MAY | .150 <T | .200 <T | . | . | .200 <T | . |
| 1992 JUL | .150 <T | .300 <T | .150 <T | . | . | . |
| 1992 OCT | .100 <T | .100 <T | BDL | . | . | . |
| P-XYLENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 300 (A3*) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| M-XYLENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 300 (A3*) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | . | . | . |
| 1991 JUN | BDL | BDL | BDL | . | BDL | . |
| 1991 AUG | BDL | .100 <T | BDL | . | BDL | . |
| 1991 OCT | BDL | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | . |
| 1992 FEB | BDL | BDL | BDL | . | . | . |
| 1992 MAY | .200 <T | BDL | . | . | BDL | . |
| 1992 JUL | BDL | .200 <T | BDL | . | . | . |
| 1992 OCT | BDL | BDL | BDL | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| VOLATILES | | | | | | |
| O-XYLENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 300 (A3*) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | . | . | . |
| 1991 JUN | BDL | BDL | BDL | . | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | BDL | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | . |
| 1992 FEB | BDL | BDL | BDL | . | . | . |
| 1992 MAY | .100 <T | BDL | . | . | BDL | . |
| 1992 JUL | BDL | .100 <T | BDL | . | . | . |
| 1992 OCT | BDL | .050 <T | BDL | . | . | . |
| STYRENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 100 (D1) | |
| 1991 FEB | .250 <T | BDL | . | . | BDL | . |
| 1991 APR | .050 <T | BDL | .050 <T | . | . | . |
| 1991 JUN | .050 <T | BDL | .050 <T | . | .050 <T | . |
| 1991 AUG | BDL | .050 <T | .200 <T | . | .200 <T | . |
| 1991 OCT | .150 <T | BDL | .150 <T | . | .100 <T | . |
| 1991 DEC | .050 <T | BDL | .150 <T | . | .100 <T | . |
| 1992 FEB | .150 <T | .050 <T | .350 <T | . | . | . |
| 1992 MAY | .250 <T | BDL | . | . | .250 <T | . |
| 1992 JUL | .250 <T | BDL | .150 <T | . | . | . |
| 1992 OCT | .150 <T | BDL | BDL | . | . | . |
| 1,1-DICHLOROETHYLENE (UG/L ) | | | DET'N LIMIT = 0.100 | | GUIDELINE = 7 (D1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| METHYLENE CHLORIDE (UG/L ) | | | DET'N LIMIT = 0.50 | | GUIDELINE = 50 (A1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| T12-DICHLOROETHYLENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 70 (D1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1,1-DICHLOROETHANE (UG/L ) | | | DET'N LIMIT = 0.100 | | GUIDELINE = N/A | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| VOLATILES | | | | | | |
| CHLOROFORM (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 350 (A1+) | |
| 1991 FEB | 9.400 | 23.000 | . | . | 16.500 | . |
| 1991 APR | .200 <T | 33.700 | 19.600 | . | . | . |
| 1991 JUN | 4.900 | 26.400 | 19.000 | . | 20.600 | . |
| 1991 AUG | 4.300 | 35.000 | 21.900 | . | 22.700 | . |
| 1991 OCT | 22.100 | 34.500 | 33.700 | . | 33.100 | . |
| 1991 DEC | 14.600 | 21.400 | 17.800 | . | 19.700 | . |
| 1992 FEB | 12.900 | 17.300 | 16.400 | . | . | . |
| 1992 MAY | 11.400 | 26.300 | . | . | 20.500 | . |
| 1992 JUL | 7.200 | 38.900 | 29.400 | . | . | . |
| 1992 OCT | .200 <T | 25.300 | 28.500 | . | . | . |
| 111,TRICHLOROETHANE (UG/L ) | | | DET'N LIMIT = 0.02 | | GUIDELINE = 200 (D1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1,2 DICHLOROETHANE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 5 (A1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| CARBON TETRACHLORIDE (UG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 5 (A1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1,2-DICHLOROPROPANE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 5 (D1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| TRICHLOROETHYLENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 50 (A1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| DICHLOROBROMOMETHANE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 350 (A1+) | |
| 1991 FEB | 7.300 | 11.300 | . | . | 8.500 | . |
| 1991 APR | .150 <T | 10.200 | 7.600 | . | . | . |
| 1991 JUN | 4.950 | 11.650 | 10.450 | . | 11.100 | . |
| 1991 AUG | 2.350 | 10.950 | 9.550 | . | 9.850 | . |
| 1991 OCT | 9.800 | 9.600 | 11.700 | . | 11.200 | . |
| 1991 DEC | 8.650 | 8.900 | 7.900 | . | 8.400 | . |
| 1992 FEB | 10.750 | 11.250 | 9.650 | . | . | . |
| 1992 MAY | 8.400 | 10.700 | . | . | 9.300 | . |
| 1992 JUL | 6.500 | 14.650 | 13.350 | . | . | . |
| 1992 OCT | BDL | 11.900 | 13.700 | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| VOLATILES | | | | | | |
| 112-TRICHLOROETHANE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 0.6 (D4) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| CHLORODIBROMOMETHANE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 350 (A1+) | |
| 1991 FEB | 3.400 | 4.200 | . | . | 3.500 | . |
| 1991 APR | BDL | 3.300 | 3.100 | . | . | . |
| 1991 JUN | 2.800 | 5.000 | 4.700 | . | 5.000 | . |
| 1991 AUG | .700 <T | 4.200 | 3.900 | . | 4.200 | . |
| 1991 OCT | 3.000 | 3.700 | 4.500 | . | 4.500 | . |
| 1991 DEC | 3.500 | 2.900 | 2.700 | . | 2.900 | . |
| 1992 FEB | 5.500 | 5.300 | 4.700 | . | . | . |
| 1992 MAY | 4.600 | 4.700 | . | . | 4.300 | . |
| 1992 JUL | 4.000 | 6.900 | 6.500 | . | . | . |
| 1992 OCT | BDL | 5.700 | 6.200 | . | . | . |
| TETRACHLOROETHYLENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 65 (A5) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| BROMOFORM (UG/L ) | | | DET'N LIMIT = 0.20 | | GUIDELINE = 350 (A1+) | |
| 1991 FEB | .400 <T | .400 <T | . | . | .200 <T | . |
| 1991 APR | BDL | .200 <T | BDL | . | . | . |
| 1991 JUN | BDL | BDL | BDL | . | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | BDL | BDL | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | . |
| 1992 FEB | BDL | BDL | BDL | . | . | . |
| 1992 MAY | BDL | BDL | . | . | BDL | . |
| 1992 JUL | BDL | .800 <T | .600 <T | . | . | . |
| 1992 OCT | BDL | BDL | BDL | . | . | . |
| 1122-TETCHLOROETHANE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 0.17 (D4) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| VINYL CHLORIDE (UG/L ) | | | DET'N LIMIT = 0.100 | | GUIDELINE = 2 (D1) | |
| 9 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| C12-DICHLOROETHYLENE (UG/L ) | | | DET'N LIMIT = 0.100 | | GUIDELINE = 70 (D1) | |
| 9 SAMPLES | BDL | BDL | BDL | . | BDL | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| VOLATILES | | | | | | |
| CHLOROBENZENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 1510 (D3) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1,4-DICHLOROBENZENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 5 (A1) | |
| 1991 FEB | BDL | BDL | . | . | BDL | . |
| 1991 APR | BDL | BDL | BDL | . | . | . |
| 1991 JUN | BDL | BDL | BDL | . | BDL | . |
| 1991 AUG | BDL | BDL | BDL | . | BDL | . |
| 1991 OCT | BDL | .200 <T | BDL | . | BDL | . |
| 1991 DEC | BDL | BDL | BDL | . | BDL | . |
| 1992 FEB | BDL | BDL | BDL | . | . | . |
| 1992 MAY | BDL | BDL | . | . | BDL | . |
| 1992 JUL | BDL | BDL | BDL | . | . | . |
| 1992 OCT | BDL | BDL | BDL | . | . | . |
| 1,3-DICHLOROBENZENE (UG/L ) | | | DET'N LIMIT = 0.10 | | GUIDELINE = 3750 (D3) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| 1,2-DICHLOROBENZENE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 200 (A1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| ETHYLENE DIBROMIDE (UG/L ) | | | DET'N LIMIT = 0.05 | | GUIDELINE = 50 (D1) | |
| 34 SAMPLES | BDL | BDL | BDL | . | BDL | . |
| TOTL TRIHALOMETHANES (UG/L ) | | | DET'N LIMIT = 0.50 | | GUIDELINE = 350 (A1) | |
| 1991 FEB | 20.450 | 38.750 | . | . | 28.750 | . |
| 1991 APR | BDL | 47.400 | 30.300 | . | . | . |
| 1991 JUN | 12.650 | 43.050 | 34.150 | . | 36.700 | . |
| 1991 AUG | 7.350 | 50.150 | 35.350 | . | 36.750 | . |
| 1991 OCT | 34.900 | 47.800 | 49.900 | . | 48.800 | . |
| 1991 DEC | 20.300 | 33.200 | 28.400 | . | 31.000 | . |
| 1992 FEB | 29.150 | 33.850 | 30.750 | . | . | . |
| 1992 MAY | 24.400 | 41.700 | . | . | 34.100 | . |
| 1992 JUL | 17.700 | 61.250 | 49.850 | . | . | . |
| 1992 OCT | BDL | 42.900 | 48.400 | . | . | . |

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHATHAM WTP

| | TREATMENT PLANT RAW | TREATMENT PLANT TREATED | DIST. SYSTEM MCFADDEN AVE FREE FLOW | DIST. SYSTEM MCFADDEN AVE STANDING | DIST. SYSTEM KERR ST FREE FLOW | DIST. SYSTEM KERR ST STANDING |
|---|---|---|---|---|---|---|
| RADIONUCLIDES | | | | | | |
| COBALT 60 (BQ/L ) | | | DET'N LIMIT = 0.70 | | GUIDELINE = N/A | |
| 4 SAMPLES | BDL | BDL | | | | |
| CESIUM 134 (BQ/L ) | | | DET'N LIMIT = 0.70 | | GUIDELINE = N/A | |
| 4 SAMPLES | BDL | BDL | | | | |
| CESIUM 137 (BQ/L ) | | | DET'N LIMIT = 0.70 | | GUIDELINE = 50 (A1) | |
| 4 SAMPLES | BDL | BDL | | | | |
| GROSS ALPHA COUNT (BQ/L ) | | | DET'N LIMIT = 0.04 | | GUIDELINE = 0.55 (D1) | |
| 4 SAMPLES | BDL | BDL | | | | |
| GROSS BETA COUNT (BQ/L ) | | | DET'N LIMIT = 0.04 | | GUIDELINE = N/A | |
| 1991 FEB | .120 | .110 | | | | |
| 1991 AUG | .100 | .100 | | | | |
| TRITIUM (BQ/L ) | | | DET'N LIMIT = 7.00 | | GUIDELINE = 40000 (A1) | |
| 1991 FEB | BDL | 12.000 | | | | |
| 1991 AUG | BDL | BDL | | | | |
| IODINE 131 (BQ/L ) | | | DET'N LIMIT = 0.70 | | GUIDELINE = 10 (A1) | |
| 4 SAMPLES | BDL | BDL | | | | |

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

| SCAN/PARAMETER | UNIT | DETECTION LIMIT | GUIDELINE | |
|---|---|---|---|---|
| **BACTERIOLOGICAL** | | | | |
| FECAL COLIFORM MEMBRANE FILTRATION | CT/100ML | 0 | 0 | (A1) |
| STANDARD PLATE COUNT MEMBRANE FILT. | CT/ML | 0 | 500/ML | (A3) |
| TOTAL COLIFORM BACKGROUND MF | CT/100ML | 0 | N/A | |
| TOTAL COLIFORM MEMBRANE FILTRATION | CT/100ML | 0 | 5/100ML | (A1) |
| **CHEMISTRY (FLD)** | | | | |
| FIELD COMBINED CHLORINE RESIDUAL | MG/L | 0 | N/A | |
| FIELD TOTAL CHLORINE RESIDUAL | MG/L | 0 | N/A | |
| FIELD FREE CHLORINE RESIDUAL | MG/L | 0 | N/A | |
| FIELD PH | DMNSLESS | N/A | 6.5-8.5 | (A4) |
| FIELD TEMPERATURE | DEG.C | N/A | 15.0 | (A3) |
| FIELD TURBIDITY | FTU | N/A | 1.0 | (A1) |
| **CHEMISTRY (LAB)** | | | | |
| ALKALINITY | MG/L | 0.20 | 30-500 | (A4) |
| AMMONIUM TOTAL | MG/L | 0.002 | 0.05 | (F2) |
| CALCIUM | MG/L | 0.20 | 100.0 | (F2) |
| CHLORIDE | MG/L | 0.20 | 250.0 | (A3) |
| COLOUR | TCU | 0.50 | 5.0 | (A3) |
| CONDUCTIVITY | UMHO/CM | 1.00 | 400.0 | (F2) |
| CYANIDE | MG/L | 0.001 | 0.2 | (A1) |
| DISSOLVED ORGANIC CARBON | MG/L | 0.10 | 5.0 | (A3) |
| FLUORIDE | MG/L | 0.01 | 1.5* | (A1) |
| HARDNESS | MG/L | 0.50 | 80-100 | (A4) |
| IONCAL | DMNSLESS | N/A | N/A | |
| LANGELIERS INDEX | DMNSLESS | N/A | N/A | |
| MAGNESIUM | MG/L | 0.10 | 30.0 | (F2) |
| NITRATES (TOTAL) | MG/L | 0.005 | 10.0 | (A1) |
| NITRITE | MG/L | 0.001 | 1.0 | (A1) |
| NITROGEN TOTAL KJELDAHL | MG/L | 0.02 | N/A | |
| PH | DMNSLESS | N/A | 6.5-8.5 | (A4) |
| PHOSPHORUS FIL REACT | MG/L | 0.0005 | N/A | |
| PHOSPHORUS TOTAL | MG/L | 0.002 | 0.4 | (F2) |
| POTASSIUM | MG/L | 0.010 | 10.0 | (F2) |
| RESIDUE FILTRATE (CALCULATED TDS) | MG/L | N/A | 500.0 | (A3) |
| SODIUM | MG/L | 0.20 | 200.0 | (A4) |
| SULPHATE | MG/L | 0.20 | 500.0 | (A4) |
| TURBIDITY | FTU | 0.05 | 1.0 | (A1) |

* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.

| | | | | |
|---|---|---|---|---|
| **CHLOROAROMATICS** | | | | |
| 1,2,3-TRICHLOROBENZENE | NG/L | 5.0 | N/A | |
| 1,2,3,4-TETRACHLOROBENZENE | NG/L | 1.0 | N/A | |
| 1,2,3,5-TETRACHLOROBENZENE | NG/L | 1.0 | N/A | |
| 1,2,4-TRICHLOROBENZENE | NG/L | 5.0 | 10000 | (I) |
| 1,2,4,5-TETRACHLOROBENZENE | NG/L | 1.0 | 38000 | (D4) |
| 1,3,5-TRICHLOROBENZENE | NG/L | 5.0 | N/A | |
| 2,3,6-TRICHLOROTOLUENE | NG/L | 5.0 | N/A | |
| 2,4,5-TRICHLOROTOLUENE | NG/L | 5.0 | N/A | |
| 2,6A-TRICHLOROTOLUENE | NG/L | 5.0 | N/A | |
| HEXACHLOROBENZENE (HCB) | NG/L | 1.0 | 10 | (C1) |
| HEXACHLOROBUTADIENE | NG/L | 1.0 | 450 | (D4) |
| HEXACHLOROETHANE | NG/L | 1.0 | 1900 | (D4) |
| OCTACHLOROSTYRENE | NG/L | 1.0 | N/A | |
| PENTACHLOROBENZENE | NG/L | 1.0 | 74000 | (D4) |
| **CHLOROPHENOLS** | | | | |
| 2,3,4-TRICHLOROPHENOL | NG/L | 100.0 | N/A | |
| 2,3,4,5-TETRACHLOROPHENOL | NG/L | 20.0 | N/A | |
| 2,3,5,6-TETRACHLOROPHENOL | NG/L | 10.0 | N/A | |

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

| SCAN/PARAMETER | UNIT | DETECTION LIMIT | GUIDELINE | |
|---|---|---|---|---|
| 2,4,5-TRICHLOROPHENOL | NG/L | 100.0 | 2600000 | (D4) |
| 2,4,6-TRICHLOROPHENOL | NG/L | 20.0 | 5000 | (A1) |
| PENTACHLOROPHENOL | NG/L | 10.0 | 60000 | (A1) |
| METALS | | | | |
| ALUMINUM | UG/L | 0.10 | 100 | (A4) |
| ANTIMONY | UG/L | 0.05 | 146 | (D4) |
| ARSENIC | UG/L | 0.10 | 25 | (A1) |
| BARIUM | UG/L | 0.05 | 1000 | (A2) |
| BERYLLIUM | UG/L | 0.05 | 6800 | (D4) |
| BORON | UG/L | 2.00 | 5000 | (A1) |
| CADMIUM | UG/L | 0.05 | 5 | (A1) |
| CHROMIUM | UG/L | 0.50 | 50 | (A1) |
| COBALT | UG/L | 0.02 | N/A | |
| COPPER | UG/L | 0.50 | 1000 | (A3) |
| IRON | UG/L | 6.00 | 300 | (A3) |
| LEAD | UG/L | 0.05 | 10 | (A1) |
| MANGANESE | UG/L | 0.05 | 50 | (A3) |
| MERCURY | UG/L | 0.02 | 1 | (A1) |
| MOLYBDENUM | UG/L | 0.05 | N/A | |
| NICKEL | UG/L | 0.20 | 350 | (D3) |
| SELENIUM | UG/L | 1.00 | 10 | (A1) |
| SILVER | UG/L | 0.05 | N/A | |
| STRONTIUM | UG/L | 0.10 | N/A | |
| THALLIUM | UG/L | 0.05 | 13 | (D4) |
| TITANIUM | UG/L | 0.50 | N/A | |
| URANIUM | UG/L | 0.05 | 100 | (A1) |
| VANADIUM | UG/L | 0.05 | N/A | |
| ZINC | UG/L | 0.20 | 5000 | (A3) |
| POLYNUCLEAR AROMATIC HYDROCARBONS | | | | |
| ANTHRACENE | NG/L | 1.0 | N/A | |
| BENZO(A) ANTHRACENE | NG/L | 20.0 | N/A | |
| BENZO(A) PYRENE | NG/L | 5.0 | 10 | (A1) |
| BENZO(B) CHRYSENE | NG/L | 2.0 | N/A | |
| BENZO(B) FLUORANTHENE | NG/L | 10.0 | N/A | |
| BENZO(E) PYRENE | NG/L | 50.0 | N/A | |
| BENZO(G,H,I) PERYLENE | NG/L | 20.0 | N/A | |
| BENZO(K) FLUORANTHENE | NG/L | 1.0 | N/A | |
| CHRYSENE | NG/L | 50.0 | N/A | |
| CORONENE | NG/L | 10.0 | N/A | |
| DIBENZO(A,H) ANTHRACENE | NG/L | 10.0 | N/A | |
| DIMETHYL BENZO(A) ANTHRACENE | NG/L | 5.0 | N/A | |
| FLUORANTHENE | NG/L | 20.0 | 42000 | (D4) |
| INDENO(1,2,3-C,D) PYRENE | NG/L | 20.0 | N/A | |
| PERYLENE | NG/L | 10.0 | N/A | |
| PHENANTHRENE | NG/L | 10.0 | N/A | |
| PYRENE | NG/L | 20.0 | N/A | |
| PESTICIDES & PCB | | | | |
| ALACHLOR (LASSO) | NG/L | 500.0 | 5000 | (A2) |
| ALDRIN | NG/L | 1.0 | 700 | (A1) |
| ALPHA HEXACHLOROCYCLOHEXANE (BHC) | NG/L | 1.0 | 700 | (G) |
| ALPHA CHLORDANE | NG/L | 2.0 | 7000 | (A1) |
| AMETRINE | NG/L | 50.0 | 300000 | (D3) |
| ATRATONE | NG/L | 50.0 | N/A | |
| ATRAZINE | NG/L | 50.0 | 60000 | (A2) |
| DESETHYL ATRAZINE | NG/L | 200.0 | 60000 | (A2) |
| BETA HEXACHLOROCYCLOHEXANE (BHC) | NG/L | 1.0 | 300 | (G) |
| CYANAZINE (BLADEX) | NG/L | 100.0 | 10000 | (A2) |
| DIELDRIN | NG/L | 2.0 | 700 | (A1) |
| ENDOSULFAN 1 (THIODAN I) | NG/L | 2.0 | 74000 | (D4) |
| ENDOSULFAN 2 (THIODAN II) | NG/L | 5.0 | 74000 | (D4) |
| ENDOSULFAN SULPHATE (THIODAN SULPHATE) | NG/L | 5.0 | N/A | |

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

| SCAN/PARAMETER | UNIT | DETECTION LIMIT | GUIDELINE | |
|---|---|---|---|---|
| ENDRIN | NG/L | 5.0 | 1600 | (D3) |
| GAMMA CHLORDANE | NG/L | 2.0 | 7000 | (A1) |
| HEPTACHLOR | NG/L | 1.0 | 3000 | (A1) |
| HEPTACHLOR EPOXIDE | NG/L | 1.0 | 3000 | (A1) |
| HEXACHLOROCYCLOPENTADIENE | NG/L | 5.0 | 206000 | (D4) |
| LINDANE (GAMMA BHC) | NG/L | 1.0 | 4000 | (A1) |
| METHOXYCHLOR | NG/L | 5.0 | 900000 | (A1) |
| METOLACHLOR | NG/L | 500.0 | 50000 | (A2) |
| METRIBUZIN (SENCOR) | NG/L | 100.0 | 80000 | (A1) |
| MIREX | NG/L | 5.0 | N/A | |
| P,P-DDD | NG/L | 5.0 | 30000 | (A1) |
| O,P-DDT | NG/L | 5.0 | 30000 | (A1) |
| P,P-DDT | NG/L | 5.0 | 30000 | (A1) |
| P,P-DDE | NG/L | 1.0 | 30000 | (A1) |
| OXYCHLORDANE | NG/L | 2.0 | N/A | |
| PCB | NG/L | 20.0 | 3000 | (A2) |
| PROMETONE | NG/L | 50.0 | 52500 | (D3) |
| PROMETRYNE | NG/L | 50.0 | 1000 | (A2) |
| PROPAZINE | NG/L | 50.0 | 700000 | (D3) |
| SIMAZINE | NG/L | 50.0 | 10000 | (A2) |
| DESETHYL SIMAZINE | NG/L | 200.0 | 10000 | (A2) |
| TOXAPHENE | NG/L | 500.0 | 5000 | (A1) |
| PHENOLICS | | | | |
| PHENOLICS (UNFILTERED REACTIVE) | UG/L | 0.2 | N/A | |
| SPECIFIC PESTICIDES | | | | |
| 2,4 D PROPIONIC ACID | NG/L | 100.0 | N/A | |
| 2,4,5-TRICHLOROPHENOXY ACETIC ACID | NG/L | 50.0 | 280000 | (A1) |
| 2,4-DICHLOROBUTYRIC ACID (2,4-D) | NG/L | 100.0 | 100000 | (A1) |
| 2,4-DICHLORORPHENOXYBUTYRIC ACID (2,4-DB) | NG/L | 200.0 | N/A | |
| 2,4,5-TP (SILVEX) | NG/L | 20.0 | 10000 | (A1) |
| BUTYLATE (SUTAN) | NG/L | 2000.0 | 245000 | (D3) |
| CARBARYL (SEVIN) | NG/L | 200.0 | 90000 | (A1) |
| CARBOFURAN | NG/L | 2000.0 | 90000 | (A1) |
| CHLORPROPHAM (CIPC) | NG/L | 2000.0 | 350000 | (G) |
| CHLORPYRIFOS (DURSBAN) | NG/L | 20.0 | N/A | |
| DIALLATE | NG/L | 2000.0 | N/A | |
| DIAZINON | NG/L | 20.0 | 20000 | (A1) |
| DICAMBA | NG/L | 50.0 | 120000 | (A1) |
| DICHLOROVOS | NG/L | 20.0 | N/A | |
| EPTAM | NG/L | 2000.0 | N/A | |
| ETHION | NG/L | 20.0 | 35000 | (G) |
| IPC | NG/L | 2000.0 | N/A | |
| MALATHION | NG/L | 20.0 | 190000 | (A1) |
| METHYL PARATHION | NG/L | 50.0 | 9000 | (D3) |
| METHYLTRITHION | NG/L | 20.0 | N/A | |
| MEVINPHOS | NG/L | 20.0 | N/A | |
| PARATHION | NG/L | 20.0 | 50000 | (A1) |
| PHORATE (THIMET) | NG/L | 20.0 | 2000 | (A2) |
| PICHLORAM | NG/L | 100.0 | 190000 | (A2) |
| PROPOXUR (BAYGON) | NG/L | 2000.0 | 140000 | (D3) |
| RELDAN | NG/L | 20.0 | N/A | |
| RONNEL | NG/L | 20.0 | N/A | |
| VOLATILES | | | | |
| 1,1-DICHLOROETHANE | UG/L | 0.10 | N/A | |
| 1,1-DICHLOROETHYLENE | UG/L | 0.10 | 7 | (D1) |
| 1,2-DICHLOROBENZENE | UG/L | 0.05 | 200 | (A1) |
| 1,2-DICHLOROETHANE | UG/L | 0.05 | 5 | (A1) |
| 1,2-DICHLOROPROPANE | UG/L | 0.05 | 5 | (D1) |
| 1,3-DICHLOROBENZENE | UG/L | 0.10 | 3750 | (D3) |
| 1,4-DICHLOROBENZENE | UG/L | 0.10 | 5 | (A1) |
| 1,1,1-TRICHLOROETHANE | UG/L | 0.02 | 200 | (D1) |
| 1,1,2-TRICHLOROETHANE | UG/L | 0.05 | 0.6 | (D4) |
| 1,1,2,2-TETRACHLOROETHANE | UG/L | 0.05 | 0.17 | (D4) |

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

| SCAN/PARAMETER | UNIT | DETECTION LIMIT | GUIDELINE | |
|---|---|---|---|---|
| BENZENE | UG/L | 0.05 | 5 | (A1) |
| BROMOFORM | UG/L | 0.20 | 350 | (A1+) |
| CARBON TETRACHLORIDE | UG/L | 0.20 | 5 | (A1) |
| CHLOROBENZENE | UG/L | 0.10 | 1510 | (D3) |
| CHLORODIBROMOMETHANE | UG/L | 0.10 | 350 | (A1+) |
| CHLOROFORM | UG/L | 0.10 | 350 | (A1+) |
| CIS 1,2-DICHLOROETHYLENE | UG/L | 0.10 | 70 | (D1) |
| DICHLOROBROMOMETHANE | UG/L | 0.05 | 350 | (A1+) |
| ETHYLENE DIBROMIDE | UG/L | 0.05 | 50 | (D1) |
| ETHYLBENZENE | UG/L | 0.05 | 2.4 | (A3) |
| M-XYLENE | UG/L | 0.10 | 300 | (A3*) |
| METHYLENE CHLORIDE | UG/L | 0.50 | 50 | (A1) |
| O-XYLENE | UG/L | 0.05 | 300 | (A3*) |
| P-XYLENE | UG/L | 0.10 | 300 | (A3*) |
| STYRENE | UG/L | 0.05 | 100 | (D1) |
| TETRACHLOROETHYLENE | UG/L | 0.05 | 65 | (A5) |
| TRANS 1,2-DICHLOROETHYLENE | UG/L | 0.10 | 70 | (D1) |
| TOLUENE | UG/L | 0.05 | 24 | (A3) |
| TOTAL TRIHALOMETHANES | UG/L | 0.50 | 350 | (A1) |
| TRICHLOROETHYLENE | UG/L | 0.10 | 50 | (A1) |
| VINYL CHLORIDE | UG/L | 0.10 | 2 | (D1) |
| RADIONUCLIDES | | | | |
| TRITIUM | BQ/L | 7.0 | 40000 | (A1) |
| GROSS ALPHA COUNT | BQ/L | 0.04 | 0.55# | (D1) |
| GROSS BETA COUNT | BQ/L | 0.04 | N/A | |
| COBALT 60 | BQ/L | 0.70 | N/A | |
| CESIUM 134 | BQ/L | 0.70 | N/A | |
| CESIUM 137 | BQ/L | 0.70 | 50 | (A1) |
| IODINE 131 | BQ/L | 0.70 | 10 | (A1) |

# Equal to 15.0 Picocuries/litre

Appendix A

## DRINKING WATER SURVEILLANCE PROGRAM
## PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

### PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY
All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS
Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS
Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME
Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION
This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

| | |
|---|---|
| **NAME:** | BENZENE |
| **CAS#:** | 71-43-2 |
| **MOLECULAR FORMULAE:** | $C_6H_6$ |
| **DETECTION LIMIT:** | (FOR METHOD POCODO) 0.05 µg/L |
| **SYNONYMS:** | BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)<br>CYCLOHEXATRIENE (41) |
| **CHARACTERISTICS:** | COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30) |
| **PROPERTIES:** | SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)<br>THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER<br>THRESHOLD TASTE: 0.5 mg/L IN WATER (39)<br>ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80) |
| **SOURCES:** | COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.<br>ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF. |
| **USES:** | DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE. |
| **REMOVAL:** | THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION |
| **ADDITIONAL PROPERTIES:** | MOLECULAR WEIGHT: 78.12<br>MELTING POINT: 5.5°C (27)<br>BOILING POINT: 80.1°C (27)<br>SPECIFIC GRAVITY: 0.8790 AT 20°C (27)<br>VAPOUR PRESSURE: 100 MM AT 26.1°C (27)<br>HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)<br>LOG OCT./WATER PARTITON COEFFICIENT: 1.95 TO 2.13 (39)<br>CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)<br>SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA |

Appendix B

## DWSP SAMPLING GUIDELINE

**i) Raw and Treated at Plant**

| | |
|---|---|
| General Chemistry | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap with sample water three times<br>-fill to 2 cm from top |
| Bacteriological | -220 mL plastic bottle with white seal on cap<br>-do not rinse bottle, preservative has been added<br>-avoid touching bottle neck or inside of cap<br>-fill to top of red label as marked |
| Metals | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap three times<br>-fill to 2 cm from top<br>-add 10 drops nitric acid ($HNO_3$)<br>(**Caution:** $HNO_3$ is corrosive) |
| Volatiles (duplicates)<br>(OPOPUP) | -45 mL glass vial with septum<br>(teflon side must be in contact with sample)<br>-do not rinse bottle<br>-fill bottle completely without bubbles |
| Organics<br>(OWOC),(OWTRI) | -1 L amber glass bottle per scan<br>-do not rinse bottle<br>-fill to 2 cm from top |
| Specific Pesticides<br>(OWCP),(PEOP),(PECAR) | -as per Organics<br>-three extra bottles must be filled |
| Polyaromatic hydrocarbons<br>(OAPAHX) | -1 L amber glass bottle per scan<br>-do not rinse bottle<br>-fill to 2 cm from top<br>-add 25 drops of sodium thiosulphate |
| Cyanide (Treated only) | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap three times<br>-fill to 2 cm from top<br>-add 10 drops sodium hydroxide (NaOH)<br>(**Caution:** NaOH is corrosive) |
| Mercury | -250 mL glass bottle<br>-rinse bottle and cap three times<br>-fill to top of label<br>-add 20 drops each nitric acid ($HNO_3$)<br>and potassium dichromate ($K_2Cr_2O_7$)<br>(**Caution:** $HNO_3$&$K_2Cr_2O_7$ are corrosive) |

| | |
|---|---|
| Phenols | -250 mL glass bottle<br>-do not rinse bottle, preservative has been added<br>-fill to top of label |
| Radionuclides<br>(as scheduled) | -4 L plastic jug<br>-do not rinse, carrier added<br>-fill to 5 cm from top |
| Organic Characterization<br>(GC/MS - once per year)<br>(PBVOL),(PBEXT) | -1 L amber glass bottle; instructions as per organic<br>-250 mL glass bottle<br>-do not rinse bottle<br>-fill completely without bubbles |

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

**ii) Distribution Samples (standing water)**

| | |
|---|---|
| General Chemistry | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap with sample water three times<br>-fill to 2 cm from top |
| Metals | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap three times<br>-fill to 2 cm from top<br>-add 10 drops nitric acid ($HNO_3$)<br>(**Caution:** $HNO_3$ is corrosive) |

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

**iii) Distribution Samples (free flow)**

| | |
|---|---|
| General Chemistry | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap with sample water three times<br>-fill to 2 cm from top |
| Bacteriological | -250 mL plastic bottle with white seal on cap<br>-do <u>not</u> rinse bottle, preservative has been added<br>-avoid touching bottle neck or inside of cap<br>-fill to top of red label as marked |
| Metals | -500 mL plastic bottle (PET 500)<br>-rinse bottle and cap three times<br>-fill to 2 cm from top<br>-add 10 drops nitric acid $HNO_3$<br>(**Caution:** $HNO_3$ is corrosive) |
| Volatiles (duplicate)<br>(OPOPUP) | -45 mL glass vial with septum<br>(teflon side must be in contact with sample)<br>-do <u>not</u> rinse bottle, preservative has been added<br>-fill bottle completely without bubbles |
| Organics<br>(OWOC) | -1 L amber glass bottle per scan<br>-do <u>not</u> rinse bottle<br>-fill to 2 cm from top |
| Polyaromatic Hydrocarbons<br>(OAPAHX) | -1 L amber glass bottle per scan<br>-do <u>not</u> rinse bottle<br>-fill to 2 cm from top<br>-add 25 drops of sodium thiosulphate |

<u>Steps:</u>

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.